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COMMERCIAL CAR JOURNAL

1939 HIGHWAY Transportation SHOW

IN presenting this third annual Highway Transportation Show number, The Editors of COMMERCIAL CAR JOURNAL let the issue speak for itself. They content themselves with the hope that readers will approve their efforts to prepare a most informative and instructive issue, with emphasis, rightly so, on the future . . . a future that takes in business, engineering and legislative outlooks.

In 1939 the truck industry faces the conflicting problems of business betterment and legislative interference. The announcements of new products in this issue are sufficient evidence that the industry is determined to do all in its power to improve business conditions by offering unprecedented values. The legislative summaries also in this issue are a sufficient warning to fleet operators and the trade alike that there is work to be done resisting restrictive legislation in the 44 state legislatures meeting regularly in 1939. It is work that must be done if the industry is not to suffer.

Meanwhile we urge readers to attend the national and local truck shows . . . and to pay us a visit at our booth—28A—at the National Motor Truck Show in New York. For visiting fleet operators we will have (while they last) a free "Who's Who at the Truck Show" directory.

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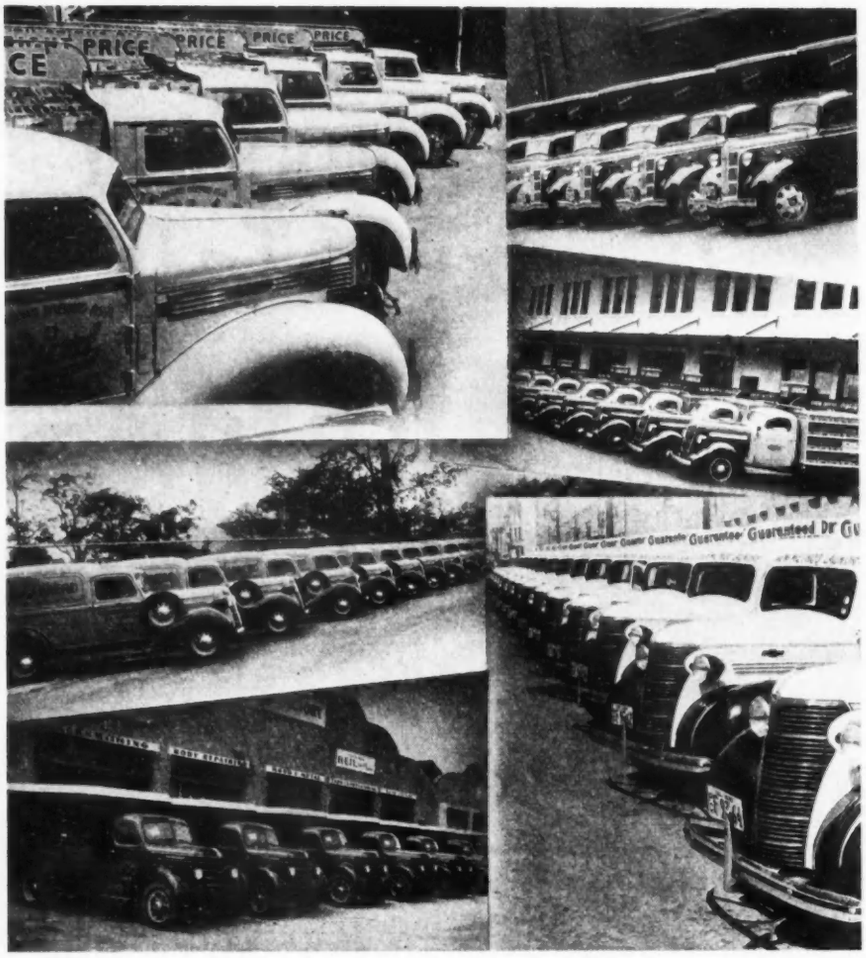


Truck Industry OUTLOOK

THE truck industry in 1939 expects to enjoy at least a 25 per cent improvement over 1938.

That is the expectation of sales executives who participated in a survey conducted by COMMERCIAL CAR JOURNAL. It was a confidential survey, which promised sales executives anonymity in return for frank replies regarding not only the statistical outlook, but also merchandising developments, time-selling, rental and fleet buying practices.

The 25 per cent gain is based on the optimism now current among business in general. There is agreement that business this fall will show a gradual improvement. It will be disappointing only to those who expected a more rapid acceleration. However, there are those who believe that acceleration will be stepped up in 1939. This group predicts a gain running as high as 40 per cent.

The 25 per cent figure is not only the conservative one but the one most widely predicted and the one cited by the bigger producers. Since truck production this year is now estimated at around 500,000, a 25 per cent gain would result in a 1939 production of around 625,000 units.

Determining Factors

On what factors will an increase in 1939 production be dependent?

Obviously, general economic conditions, which truck buying so closely parallels, will determine the extent of the gain. However, economic factors within the truck industry, which contribute their share to general conditions, are strongly indicative of definite business improvement next year. These factors are low inventory and postponed replacements.

New truck stocks in the hands of distributors, dealers and factory branches are extremely low, sales executives declare. The used-truck situation is similarly favorable.

The replacement market has been growing in size for almost a year and a half. The trucks, which should have been replaced, are becoming more costly to operate each day. Almost of necessity many operators will have to buy new vehicles in 1939. There is no doubt that the greatly in-

LEADING FACTORY SALES EXECUTIVES EXPRESS THEMSELVES RE-

creased efficiency of many new truck models will have a decidedly stimulating effect on operators who postponed replacements.

Merchandising Developments

What is the outlook for merchandising developments? Will there be any change in time-selling practices? There is some talk of selling trucks on the rental or pay-as-you-use basis, similar to the practice prevalent in the bus business. Will it get very far in the truck business? What are its likely effects?

On these important questions sales executives have decided opinions. Here are some of the more enlightening ones:

"Diesel package cars and cab-over-engine models should show greater development in 1939. We see no change in time-payment sales. Truck rentals may increase in popularity with fleet users at metropolitan centers. We do not believe it will become a detrimental factor."

"There will be some merchandising developments in trucks, but not similar to the practice that is prevalent in the bus business. There will be an increase in what is known as trucks sold on a rental basis, but not on the tremendously long terms as used in the sale of buses. Its effect will be good only providing sensible terms are used. It will be very hazardous if pay-as-you-use tactics are stretched over too long a period."

"There should be further expansion of truck rental companies but I do not look to see much development in the way of sales to retail buyers on a rental basis."

"We see no radical change in merchandising except that each succeeding year truck selling becomes a more highly competitive and, accordingly, a more intensive job. We do not anticipate any change in time-selling practices and we hope for the benefit of the industry that no other manufacturer will attempt to monkey with this very dangerous element. Time-selling practices in our industry are bad enough at the present time, and certainly no change should be made in an effort to ease them. There might be some truck using organizations which are sufficiently responsible morally and financially that they would be justified in buying trucks on a pay-as-you-use basis, but I would question the advisability of extending these terms to the average individual purchaser."

"I cannot see anything new in the way of merchandising. Time selling will go on and while there is a general tendency to cut the time down, it is possible it may be extended; that all depends on conditions. As far as we are concerned, we have nothing in view of selling trucks on a rental, pay-as-you-use basis. I know this is indulged in to some extent by some of our competitors and may be used during the coming year. We have no plans to enter any such sort of an arrangement. A straight out and out rental business on a well-organized scale is perfectly all right but stretching this sort of thing and pushing it to extremes would be very costly, in our opinion. Very definitely as a manufacturer we are not entering any rental business."

"As far as we are concerned there will be no particular change in our methods of distribution or in time selling."

In these statements there is a difference of opinion in regard to rentals and the pay-as-you-use method of selling. Readers will be able to make a properly weighted analysis if they will bear in mind that the so-called leaders represented in the statements plan no change in existing practices.

Fleet Buying Practices

What opinions do sales executives have of current buying practices of fleet operators?

The observations submitted indicate that sales executives have little fault to find with fleet buyers. Here are some of the more studied replies:

"The only situation with respect to selling to truck fleet operators where we feel somewhat helpless or discouraged is where the buying is done entirely on a reciprocal basis."

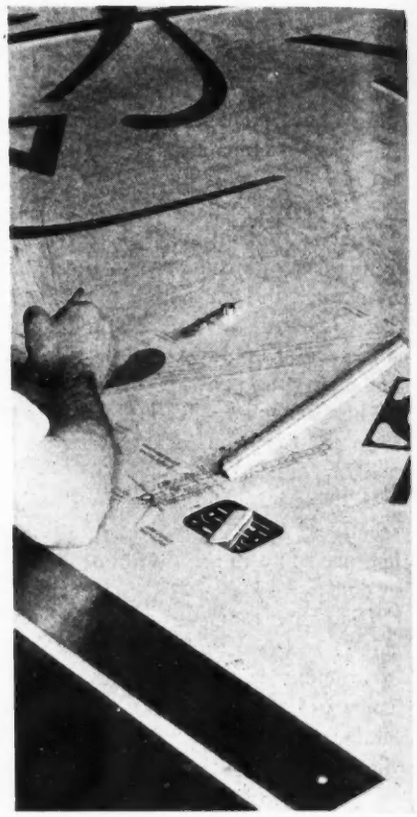
"We have nothing of any importance to say here except that the so-called national accounts or fleet owners have put off buying more than any other class of truck buyer. The big share of trucks purchased in 1938 were from the small buyers rather than from the larger owners. This is undoubtedly due to the tendency in all large corporations for the executive management or board of director to make rulings that nothing is to be spent for motor trucks until business improves. This market should be very substantial in 1939 in view of the fact that it represents a large number of trucks, many of which are old and should be replaced."

"We do not believe the buying practices of fleet operators will be changed to any great degree except that we feel quite sure that fleet operators have realized the fallacy in demanding extremely long trades and that their buying will now be based on actual values in the truck purchased with legitimate allowances for used equipment taken in trade."

"Fleet sales have many unsatisfactory aspects. This is particularly true of parts sales to fleet owners. An oil company sells gasoline and oil to a dealer at a fixed price but demands that that dealer sell to the oil company trucks and parts at a discount. Fleet sales in many respects represent one-way policies."

"I have seen no change nor do I anticipate any in what you term buying practices among truck fleet operators. Whatever their buying practices are, are determined primarily by the manufacturers who endeavor to sell them. If anyone has fault to find with these practices let him turn the spotlight on the policies of the manufacturers and he will undoubtedly find the cause of whatever troubles he believes exist."

"As a whole, fleet operators, although keen purchasers, are essentially fair and, if the product being sold them is thoroughly explained and all factors of the sale understood, they represent a very desirable class of customer. While sharp buying practices, of course, do creep in, they represent more the exception than the rule and they are to a great extent the individual temperament of some buyer rather than the basic policy of the concern they represent."



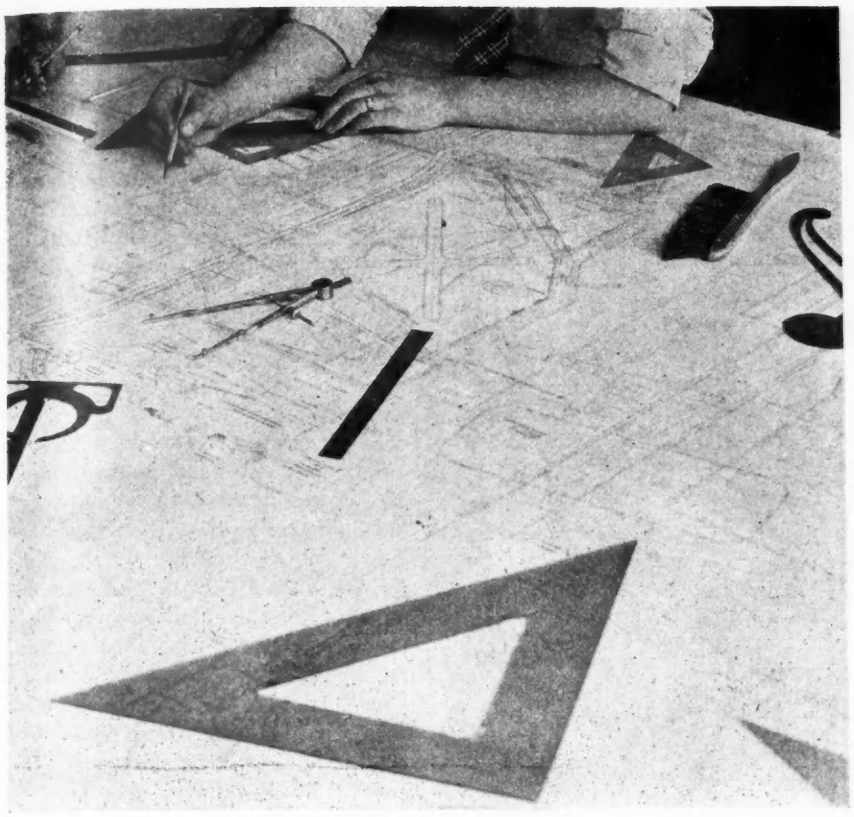
Engineering FORECAST

What's coming and likely to come in the way of truck design changes, as seen by the factory engineers

(1) Truck engineers believe that engines will produce more power as a result of better induction systems and combustion chamber design. (2) That each fleet operator should decide for himself if diesels fit his operation. (3) They cannot see superchargers as an early development nor (4) can they agree on the possibility of chassis becoming more specialized. (5) There is about an even split of opinion on the chances of radical change in transmission design and (6) they are non-commital about axle modifications because it involves politics. (7) They look for improvement in brake materials while defending the present brakes. (8) They are sure multi-stop trucks will be improved. (9) They do not see design affected by driver union activity. (10) They look for a legal performance requirement but believe that expressing it in a grade ability factor would be a mistake. (11) They see a period of continuous appearance changes.

THE truck of the future is a matter of speculation wherever fleet operators gather. To satisfy the normal curiosity of fleet operators and to help them plan for the future, COMMERCIAL CAR JOURNAL has communicated with the design heads of the industry, asking them to answer certain specific questions relative to design improvements and inviting their comments on the mechanical features of trucks not yet built. They were asked candid questions with the understanding that, in order to encourage candid answers, their names would not be identified with their remarks.

The engineers replying seem to be in pretty general agreement that there is to be an increase in the power to size ratio of present engines. All but one of the engineers agree that the promise of more power per cubic inch is correct, at least to a degree. One warns that the degree to which this development can progress is limited by lubricants, fuels and bearing materials. Another says he believes that 100 octane fuel is



not too far off as a commercial product.

Most of the power increase is to be the result of work done on the induction system and the combustion chamber, although it is pointed out that higher quality machine work and better design of some mechanical parts will minimize distortion and provide better sealing. This refers specifically to pistons, rings, cylinders and valves. However, not one of the assenters fail to mention improved combustion chamber design and better location of spark plugs is a principle means of getting more power. Several mention that dual ignition will help, especially in the large sizes. Straightening out the kinks in intake manifolds and increasing their size as well as that of the carburetor seems to be on several programs, supplemented by better controlled cooling and increased compression ratios when combustion chambers with less tendency to detonate are developed and more favorable fuels are available.

There is only one dissenting opinion. That opinion states: "It is not at all a foregone conclusion that the undoubted trend towards greater power in truck engines will necessarily take the form of increased specific output from a given size. There is even the beginning of a trend discernible towards reducing the mean effective pressures for the sake of greater reliability and durability."

In the bulk of the views, superchargers do not seem to be any closer to incorporation into truck engine design. Two opinions seem to cover the subject pretty thoroughly. "We have by no means sufficient information on superchargers at this time to warrant either wholehearted endorsement or condemnation." "The question as to whether superchargers will be practical in truck work is probably dependent upon whether the truck engines can be run at the speeds which are necessary to take advantage of the supercharging action." Others mention the delicateness of the device, its cost and the cost of maintenance.

However, there is a rebel. His words are: "Superchargers will be a logical development. Their use will permit the maximum output per pound. We are a long way from utilizing the permissible loads in the available bearing materials which fact should obviate the most serious complication or objection to the use of the supercharger."

Not a single engineer feels qualified to give an estimate of the extent to which diesel engines will replace gasoline engines. One states: "The time has arrived when every prospective buyer should carefully analyze his situation so that on a basis of simple mathematics he can reach a determination as to the correct type of engine to suit his individual needs." Another says: "The use of diesels on short hauls seems to fly in the face of all of our previous concepts of diesels economics, yet experience may bring out unsuspected advantages."

A third engineer finds that two years ago there was a strong demand for diesels, but for the last year and a half it has been diminishing. He thinks that perhaps the new type of diesel recently announced will revive the interest. The nearest thing to a positive opinion on diesel engines is from one who believes that they are suitable for only a few localized operations.

Two designers believe that truck chassis will become more specialized than they are now. The others do not think so. One thinks that the specialization of chassis is an interesting possibility for speculation but that it is not particularly imminent because there is no trend in the truck industry toward each manufacturer confining his efforts to producing trucks designed only for special uses. Since there is no such trend the cost of specialization on a coverall line would be prohibitive.

From one design room comes the opinion that there will always be customers who for advertising or functional reasons will be willing to pay for specialized chassis. The point is also made that if the present conglomeration of state regulations could be cleared up there would be more room for industrial specialization. Regardless of these difficulties one engineer says, "I believe we shall see a definite change in the character of truck designs and unquestionably

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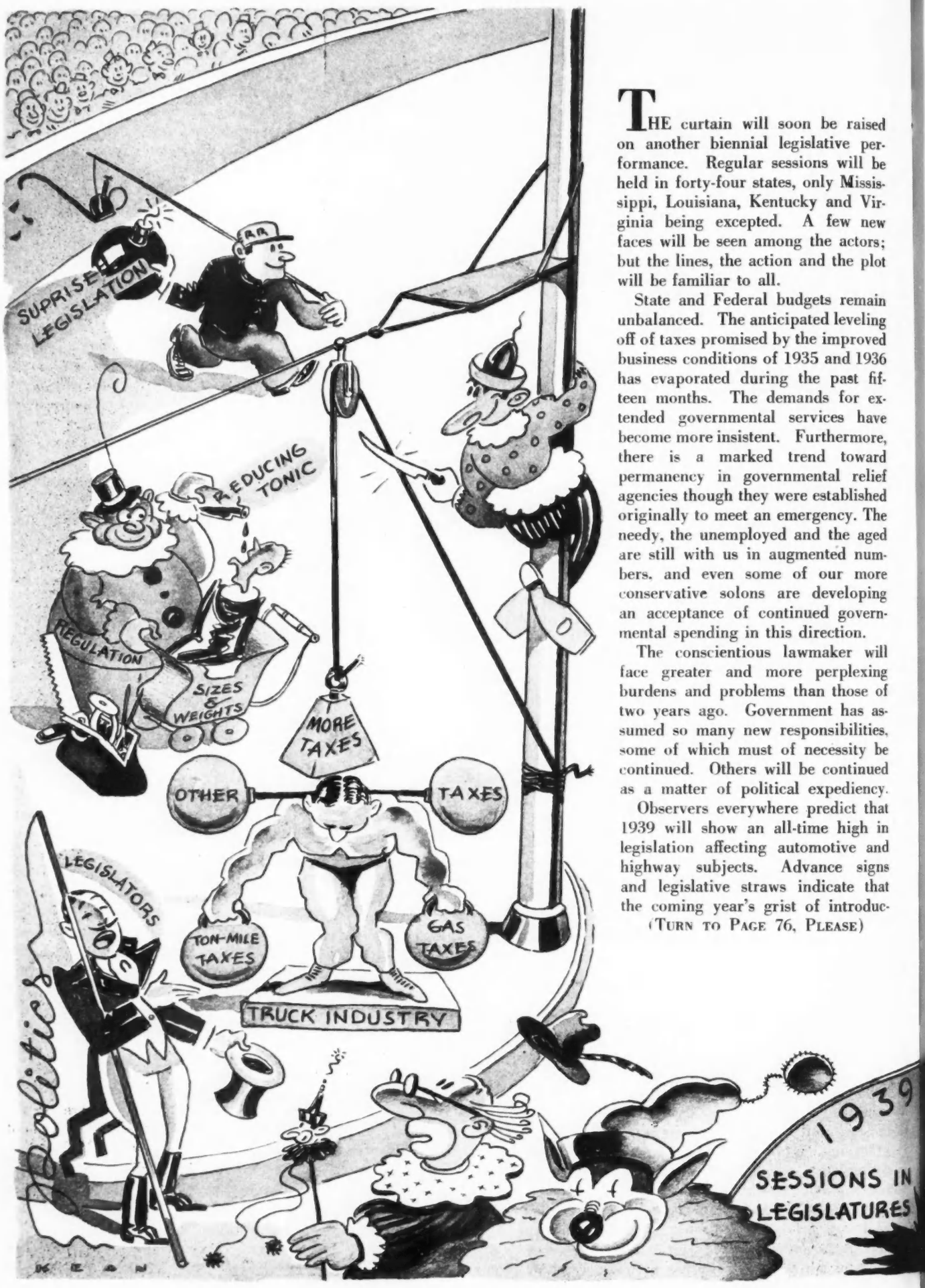

THE curtain will soon be raised on another biennial legislative performance. Regular sessions will be held in forty-four states, only Mississippi, Louisiana, Kentucky and Virginia being excepted. A few new faces will be seen among the actors; but the lines, the action and the plot will be familiar to all.

State and Federal budgets remain unbalanced. The anticipated leveling off of taxes promised by the improved business conditions of 1935 and 1936 has evaporated during the past fifteen months. The demands for extended governmental services have become more insistent. Furthermore, there is a marked trend toward permanency in governmental relief agencies though they were established originally to meet an emergency. The needy, the unemployed and the aged are still with us in augmented numbers, and even some of our more conservative solons are developing an acceptance of continued governmental spending in this direction.

The conscientious lawmaker will face greater and more perplexing burdens and problems than those of two years ago. Government has assumed so many new responsibilities, some of which must of necessity be continued. Others will be continued as a matter of political expediency.

Observers everywhere predict that 1939 will show an all-time high in legislation affecting automotive and highway subjects. Advance signs and legislative straws indicate that the coming year's grist of introduc-

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THE 44-RING LEGISLATIVE CIRCUS IS HERE AGAIN

The forthcoming performance in 44 States will differ very little from previous years except, perhaps, in quantity. Pressure groups, better organized and more determined, will sponsor ingenious plans for further restricting highway transportation. The acceptance of wider paternalistic responsibilities adds to the demands of government for more and higher taxes. Generally speaking, the highway user is confronted with the same old plot threatening him with wider diversions, increased special imposts and more restrictive regulation. Herewith the plot is exposed and garnished with a partial list of 1939 legislative issues by States.

By DAWES BRISBINE

Research Counsel, National Highway Users Conference

FLEET OPERATORS'

CATECHISM

Authorities answer the questions most frequently raised by highway transportation enemies—chiefly the railroads and railroad supporters

QUESTION 1
Is highway transportation "subsidized"?

ANSWER

Totals of motor owner taxes as shown by statistics compiled by the United States Bureau of Public Roads are presented in the following table. Figures in this table do not include income and property taxes on motor vehicle factories, garages, dealers, repair shops, terminals and truck, taxicab and bus operating companies.

	State Registration Fees	State Gasoline Tax	Federal Excise Taxes [1]	Personal Property City and County Taxes [3]	Total
1929	$347,843,543	$431,311,519	$.....	$69,940,701	$849,095,763
1930	355,704,860	493,865,117	.....	69,940,701	919,510,678
1931	344,337,654	536,397,458	.....	69,940,701	950,675,813
1932	324,273,510	513,047,239	74,377,812 [2]	69,940,701	981,639,262
1933	301,315,447	518,195,712	227,820,566	69,940,701	1,117,272,426
1934	316,754,000 [4]	565,027,000	233,439,712	69,940,701	1,185,161,413
1935	335,401,000 [4]	616,851,671	254,528,281	69,940,701	1,276,721,653
1936	374,920,000 [4]	686,631,000	292,408,342	69,940,701	1,423,900,043
1937	415,829,000 [4]	756,930,000	321,448,483	69,940,701	1,564,148,184

Figures from U. S. Bureau of Public Roads

[1] Figures from Bureau of Internal Revenue and include automotive share of the tax on gasoline and lubricating oil, the tax on automobiles, trucks, motorcycles, parts and accessories, tires and tubes.
[2] On sales between June 21st and December 31st, 1932.
[3] 1932 figures, including bridge and tunnel tolls.
[4] Includes Motor-Carrier Tax Receipts.

"Looking forward, it is reasonable to assume that for the country as a whole, if not for all states, contributions from highway users will be sufficient to cover the full cost of state and county[1] highways and an increasing portion of town roads. We conclude, therefore, that on the whole highway users are now paying for those highways which are of general use."

—Harold G. Moulton and Associates; "The American Transportation Problem," Brookings Institution, 1933, page 557.

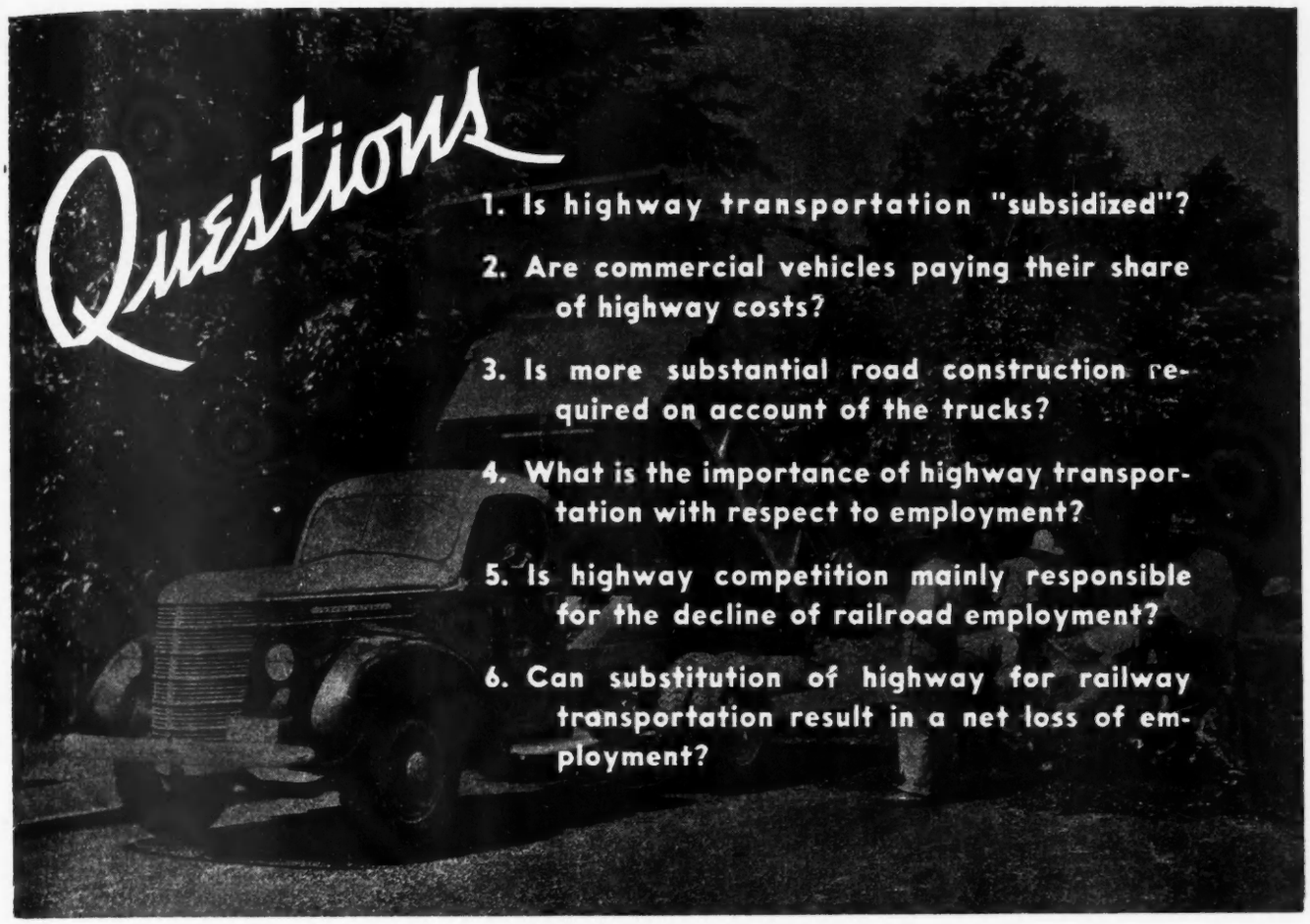
[1] In other words, contributions from highway users will actually be in excess of their fair portion, because, according to the recommendations of the Joint Committee of Railroads and Highway Users, only a part of the cost of county highways is to be paid from this source, that part to be determined by the extent to which such county highways are in general use rather than local use.

QUESTION 2
Are commercial vehicles paying their share of highway costs?

ANSWER

"It has been urged that the heavier vehicles do not pay a fair portion of the cost of road building and upkeep. In general, this is not true, although there may be specific cases in which it is a fact.

"A study in Pennsylvania indicates that only a small mileage of the total highway system is used by the heavier vehicles, but waiving this, there is now being collected


Questions
1. Is highway transportation "subsidized"?
2. Are commercial vehicles paying their share of highway costs?
3. Is more substantial road construction required on account of the trucks?
4. What is the importance of highway transportation with respect to employment?
5. Is highway competition mainly responsible for the decline of railroad employment?
6. Can substitution of highway for railway transportation result in a net loss of employment?

through gas and license fees from the various classes of heavier vehicles, a sum very closely approximating any increased cost of road construction which may be reasonably charged against the increased strength requirements of the heavier loads over the whole system."

—Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads; in "Current Phases of Highway Building and Maintenance," page 14.

"Motor busses, which included 0.2 per cent of the vehicles, contributed 1.2 per cent of the registration-fee payments and 1.2 per cent of the gasoline-tax payments."

In 1932 "motor trucks and tractor trucks, comprising 13.1 per cent of the vehicles, paid 24.2 per cent of the registration fees and 24.7 per cent of the gasoline taxes."

—The U. S. Bureau of Public Roads; "The Taxation of Motor Vehicles in 1932," October, 1934, page 3.

"In 1937, trucks were paying an even greater proportion of motor vehicle taxes.

"1934 Special Truck Taxes (state registration fees; state gasoline taxes; federal excise taxes; special city and county license fees, gas taxes, tolls, etc.; miscellaneous state taxes; excluding property tax) $417,510,000.

"Trucks comprise 14 per cent of motor vehicles and pay 28 per cent of special motor vehicles taxes."

—"Automobile Facts and Figures," 1938 Edition.

". . . The automotive vehicle is paying more annually for the use of the highways of the state than should be charged therefor and . . . the motor truck is paying more than its fair share."

—John S. Worley, Professor of Transportation Engineering, University of Michigan; in "Automotive Vehicle Fees and Taxes in Michigan," 1933, page 13.

QUESTION 3

Is more substantial road construction required on account of the trucks?

ANSWER

"Comparison of the number of heavy trucks registered in certain states with the existing mileage of high-type roads, and particularly of Portland cement concrete, in the same states leads to the conclusion that such roads have been built primarily in response to the demands of traffic in general, rather than specifically to support heavy loads."

—"The Taxation of Motor Vehicles in 1932," by the U. S. Bureau of Public Roads, October, 1934, page 4.

"The maximum difference in width between the ordinary farm truck and the widest trucks and busses appears to be only one foot and with millions of men, women and

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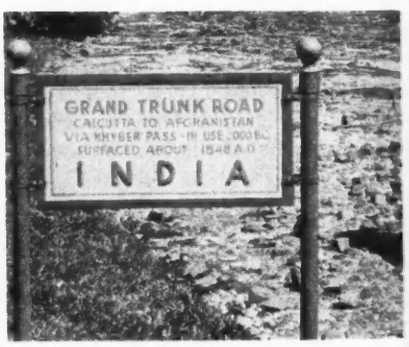
LONG before good roads were known man moved about from place to place, and when he traveled between them often enough, or in sufficiently large numbers, his very movements made paths or trails. It is doubtful if his earliest travels were in quest of beauty or for pure social pursuit. Food came first, followed by other necessities and when these had been obtained, and the route fairly well established, social intercourse followed.

When animals were captured, tamed and put into use transporting packs, their hard hoofs cutting away the soil, the paths and trails became deeper, wider and better established. More business followed and more social intercourse. At first trails were short, joining neighboring groups of people. When news arrived telling of lands and peoples beyond, the tendency was to extend the length of the trail wherever the profit motive could be favorably exercised.

The early chapters of recorded history tell of roads or ways used chiefly, if not solely, for commerce. Governments, such as they were, provided but little assistance, if any. Original routes and trails struck out across

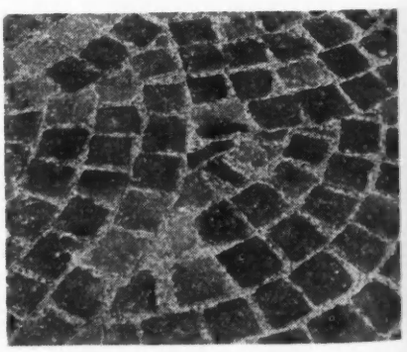


ROADS WERE BUILT FOR

From the mouths of legislators, who pioneered in the good roads movement, come reminders for legislators of today who seem to lose sight of the day-in-and-day-out purpose of the modern highway

By ROLAND RICE

Assistant Counsel, American Trucking Associations, Inc.



deserts and cut through wildernesses, wound tortuously over mountains, crossed rivers and plains to reach marts of trade and bring together seller and buyer, producer and consumer. The old caravan routes, plodded over by spongy-footed camels led the way to the East and its spices and only when western Europe was forced to, did she desert them, seeking a water passage to the Indies.

In North and South America pack animals were used in early history and are still employed in commerce; in remote areas today human beings carry weighty loads long distances over routes of trade. When the canal and railroad superseded the trail and early road, it was because they afforded a better means of commerce.

It would be a mistake to suppose that much social travel or "sightseeing" took place on the long routes painfully and unscientifically laid out in early history. The human race was too busy with its safety and existence, the means of locomotion were too limited and slow to permit travel for sheer pleasure. Marco Polo went to the Orient, using some of the earlier routes, but while his eyes feasted on strange sights, the little gentleman did a remarkable job for the historians, the geographers and the business men — especially the latter.

Roads, from the beginning of time, were built for commerce. Excellent examples of early roads are illustrated below through the courtesy of the Ford Motor Co. Below, top row: The Grand Trunk Road of India, the Wilderness Trail blazed by Daniel Boone, and original Lancaster Pike, built in 1792. Bottom row: A German Kleinpflaster road of broken rock, the Great Caravan route through the Sahara desert, and the Antioch to Bagdad road. Opposite page, top: A modern highway under construction.

In all history the succession is the same. First, commerce moves by a crude method; later, by an improved one. Commerce and business forge the routes; travel for pleasure and social intercourse follow, and finally all use the same by-ways.

Most revealing information on the purpose of good roads appears in the records and debates of Congress and in the statements of public men considering the possibility and wisdom of public aid for roads. Thomas Jefferson repeatedly urged the development of roads and canals. James Madison, in a message to Congress, urged a "comprehensive system of roads and canals such as will have the effect of drawing more closely together every part of our country by promoting intercourse and improvements and by increasing the share of every part in the common stock of national prosperity."

Both Clay and Calhoun saw in good roads a means of developing the country commercially, the former in a speech in Congress in 1818, saying, ". . . If the price of transporting a barrel of flour by the erection of the Cumberland turnpike should be lessened two dollars, the producer of the article would receive that two dollars more now than formerly." In the next year Calhoun, then Secretary of War, wrote to the House of Representatives: "The road or canal can scarcely be designated as useful for military operations that is not equally required for the industrial or political

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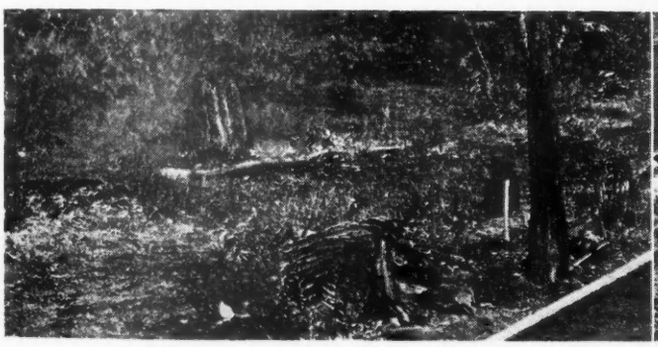


COMMERCE NOT SIGHTSEEING

COLOR Schemes FOR TRUCKS

To make trucks appear longer, shorter, larger, smaller, warm or cool is the function of design and color. Here are many practical and original painting suggestions developed by Lee Moffitt, du Pont color specialist

BY LEE MOFFITT, COLOR SPECIALIST

DESIGN and color are the important factors in planning a color scheme, the purpose of which is

(a) To attract favorable attention.

(b) To make a permanent impression associating the company or the product with the truck.

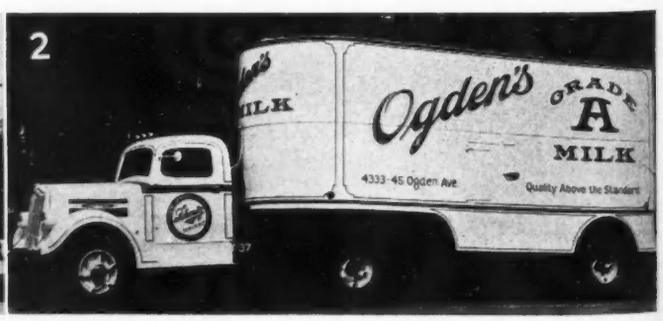
The first matter to consider is:

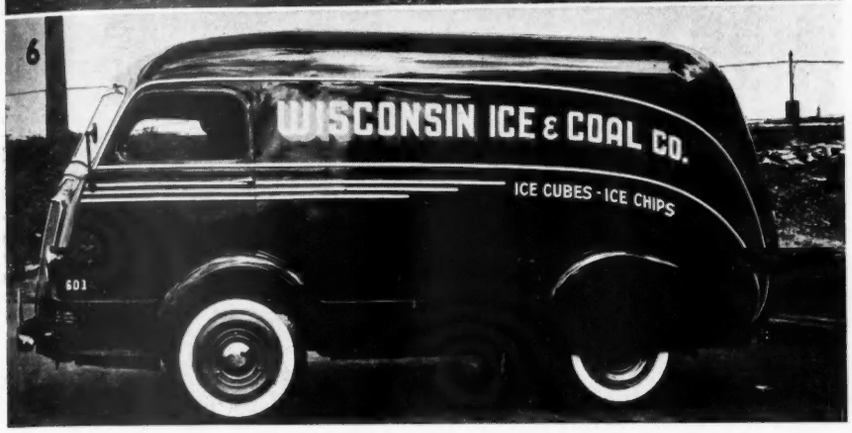
How to plan a color scheme

1. Consider the company or product to be advertised. Determine whether a warm or cool color scheme will most appropriately express the product or company.

Example: Electric and Gas Company, either a warm or cool color scheme. Coal, Furnace or Bakery Companies, a warm color scheme. Ice, Steel, Aluminum and Laundry Companies, a cool color scheme.

2. Consider the type of truck. Would it improve the appearance of the truck to make it appear longer or shorter, larger or smaller? Does the construction or design of the truck lend itself best to a solid color





1. Horizontal division of colors and prominent horizontal trim stripes make truck appear longer than it really is. 2. Vertical striping on tractor and trailer, solid color and trailer valence as well as diagonal and circular lettering tend to divide this unit into panels and make it appear shorter. 3. Exceptionally good design and if in right colors gives warm appearance. 4. White is a cool color. 5. Solid light color makes truck appear larger than it is and the impression is heightened since lettering and horizontal stripe is subordinate to overall color. 6. Solid dark color and lines that curve downward make truck appear longer than it really is.

Color Scheme Reference

To make a truck appear longer:
Color schemes 1A, 1B, 1C, 1D, 3A, 3B, 3C, 4A, 4B, 4C.

To make a truck appear shorter:
Color schemes 2A, 2B, 2C.

To create an impression of warmth:
Color schemes 3A, 3B, 1B, 1C, 1D, 2A.

To create an impression of coolness:
Color schemes 4A, 4B, 4C, 1A, 2B, 2C.

To make a truck appear larger:
Color schemes 1A, 1B, 2B, 3B.

To make a truck appear smaller:
Color schemes 1C, 1D, 2A, 2C, 3A, 3C, 4A, 4B, 4C.

or a two-toned combination?

3. Strong contrasting colors are usually preferred for lettering, striping and two-toned combinations to give maximum visibility.

Having determined the color, whether warm or cold, and the effect desired, whether long or short, large or small, consult the information under the following headings:

1. To make a truck appear longer:

Create horizontal masses of color by horizontal striping and lettering —see color scheme 1A.

Painting the roof a different color from the body color—see color scheme 1B.

Two-toned combination of strong contrasting colors dividing the truck into two horizontal planes—see color scheme 1C.

Painting the fenders and wheels a different color from the body—see color scheme 1D.

Almost any color combination can be applied to make a truck appear longer—see color schemes 1A, 1B, 1C, 1D, 3A, 3B, 3C, 4A, 4B, 4C.

2. To make a truck appear shorter:

Create vertical masses of color by:

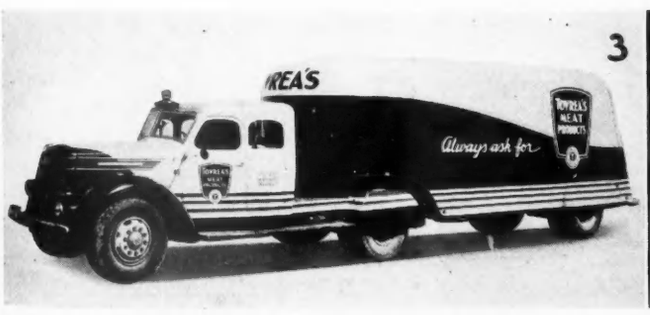
Painting the hood a color contrasting to the body color—see color scheme 2A.

Emphasizing vertical striping—see color scheme 2B.

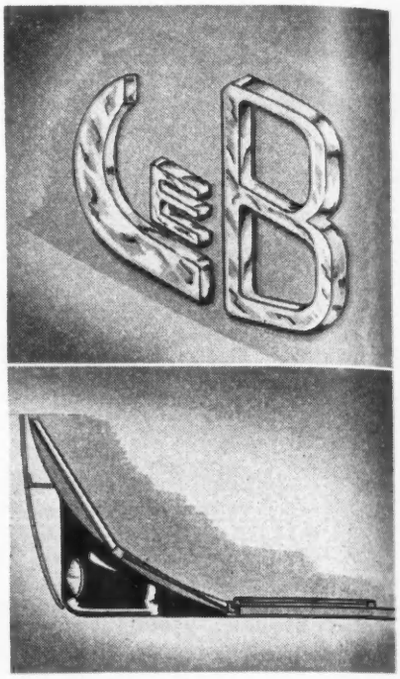
Large square or vertical lettering —see color scheme 2C.

Almost any color combination can

(Turn to Page 144, Please)



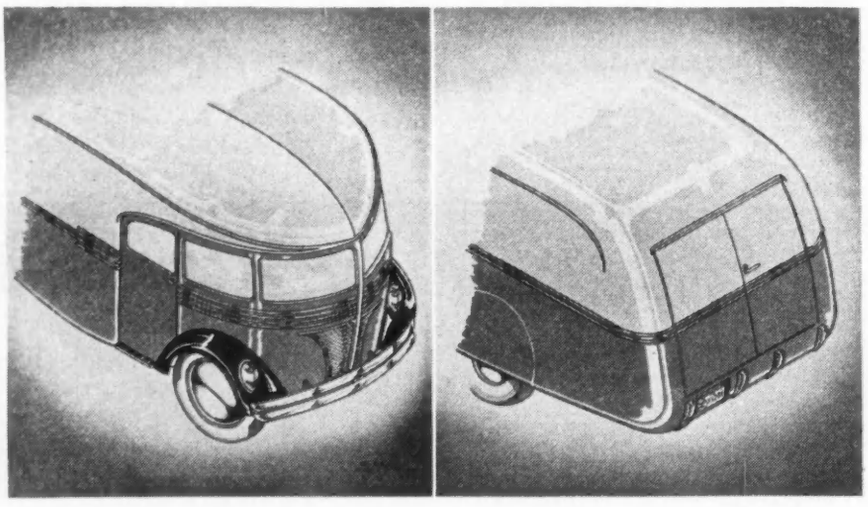
THE BODY OF-THE-MONTH



Top: Details of aluminum or chrome. Above: Section drawing looking down

DESIGN NO. 2 . . . . . C.O.E. LIGHT DELIVERY UNIT . . . . . ALL MATERIAL

Here is the seond in *Commercial Car Journal's* series of original body designs. This feature will appear each month until further notice. As we pointed out last month, the designer has worked in body shops and knows the practical problems of building truck bodies. His experience is an assurance to fleetmen that he will not design bodies thai are beautiful but dumb—beautiful to look at but impractical to operate. Fleetmen are reminded that all designs are copyright but that arrangements can be made with the designer for procuring complete construction drawings and specifications by addressing The Editor, *Commercial Car Journal*, Philadelphia, Pa. Next month's Body-of-the-Month will be a Meat Packer's body.



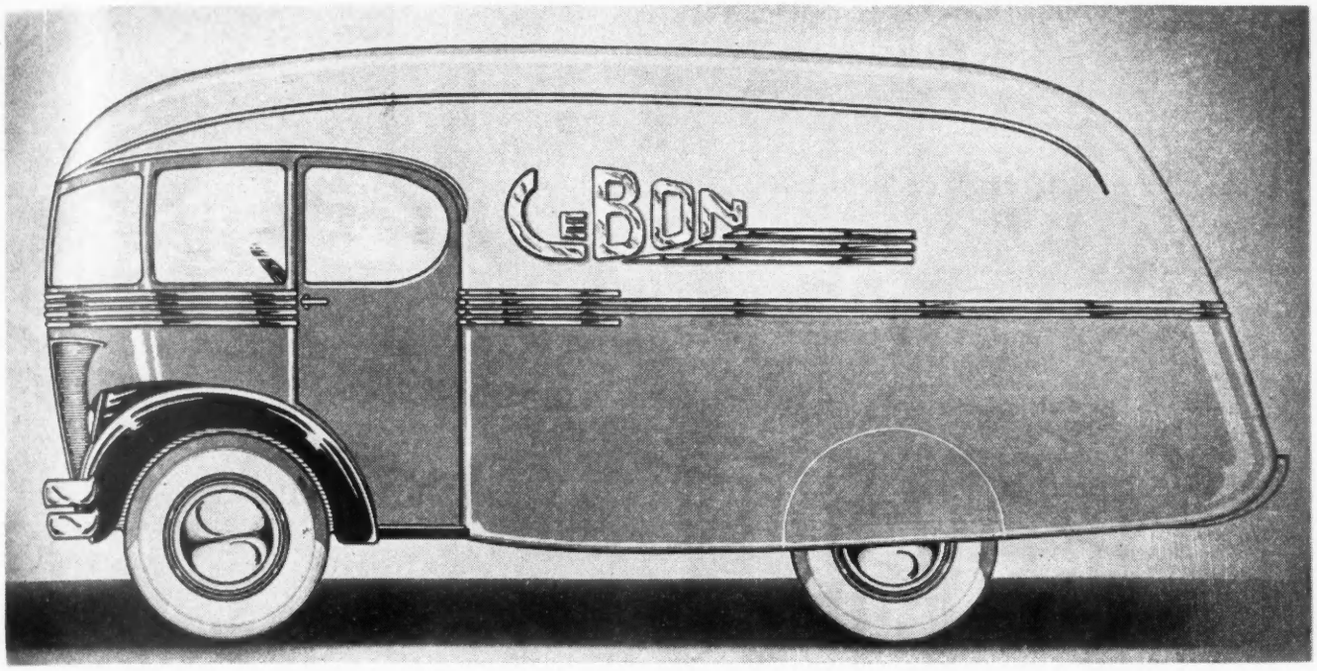
VOCATIONAL USES

This streamlined C.O.E. type light delivery unit is a bit radical but not too much so that it cannot be built. Its lines combine beauty and utility and it is adaptable to a wide range of vocations. A few of the major ones being Laundries, Bakeries, Department Stores, Dairies, Florists, etc.

DESIGN FEATURES

Appearance was but one of the major points considered in this design. Driver comfort and visibility were given a great deal of thought so as to cut driving strain and fatigue of the driver to a minimum.

The outstanding objection to the average C.O.E. light delivery unit on the road today is it's square-boxed appearance. This is eliminated in this design by using a curved "V" type front. Two things are accomplished by this. First, it eliminates the wide square front corners which are the greatest obstacle to good vision to the side and forward. Second, it contributes much to the gen-



plated letters. Above: Smooth flowing lines leave no trace of box-like appearance. There's a handy step inside the door. on left front corner. Lower left: Close-ups of front and rear perspectives. Note sharp "V" windshield and rear bumperettes.

PREPARED AND COPYRIGHT 1938 BY E. M. WESTBERG, BODY DESIGNER

eral lines of the body from the standpoint of appearance. This point is illustrated in the small corner cross-section.

In further consideration of driver comfort the front step and the top of the driver's seat from the top of the front step were so located as to allow the driver to slide onto the front seat with one effortless motion without having to lift himself in or out of the seat. This means a lot to drivers engaged in milk or bread deliveries where they are constantly jumping in and out of the body.

The suggested size of this unit would be 10 ft. 0 in. long by 5 ft. 0 in. high by 6 ft. 2 in. wide. All are inside dimensions giving a cubical capacity of approximately 300 cu. ft. A body of this size will adapt itself well to a wide range of vocations.

BODY MATERIALS

Brief specifications of the body to produce the unit shown would be a metal roof supported by formed steel carlines. The framing would be of hard wood covered with body steel over plywood and a hard wood floor. Lining would depend somewhat upon the vocation in which the body would be used.

ECONOMY POINTERS

By sacrificing appearance the body could be cheapened somewhat by using a duck roof in place of steel and by eliminating the chrome trim, using in its place a single snap-on type molding at the belt line. The lower rear ball corners could be omitted, as could the built-in license plate bracket and individual bumperettes.

COLOR SCHEMES

Color schemes and lettering would depend entirely upon the vocational use of the unit. A few examples being white or aluminum for Dairies; red and yellow for Bakeries; black, maroon, or dark blue for Department Stores, and red for Meats and Provisions. Lettering would, of course, be of some matching color.

DE LUXE DETAILS

A detail of polished cast aluminum or chrome-plated lettering as illustrated on this design is shown. Very effective appearance can be obtained with this type of lettering and it is strongly recommended.

The perspective rear-end elevation illustrated shows a countersunk license plate bracket and individual bumperettes. The bumperettes are of hard wood finished in their natural color and bound with chrome-plated steel bands. These are used primarily to eliminate the usual cumbersome rear bumper, improving the rear-end appearance.

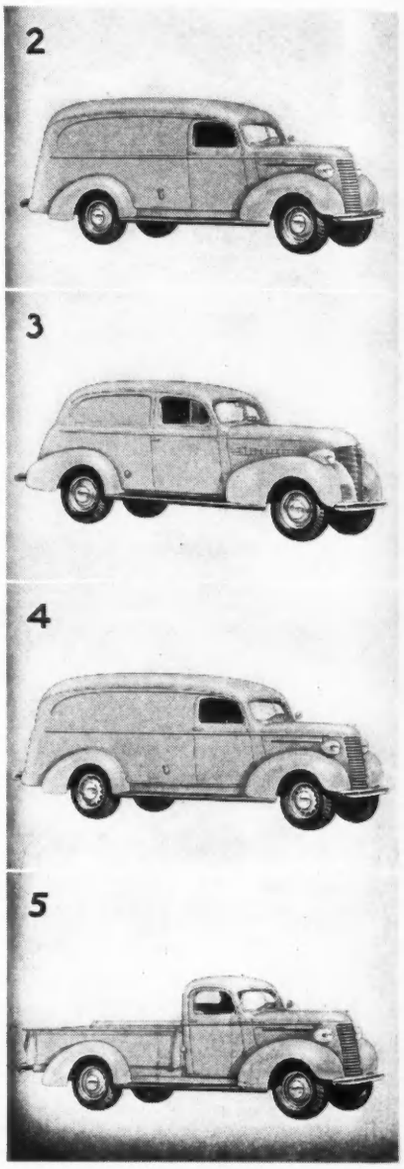
NOTE TO READERS

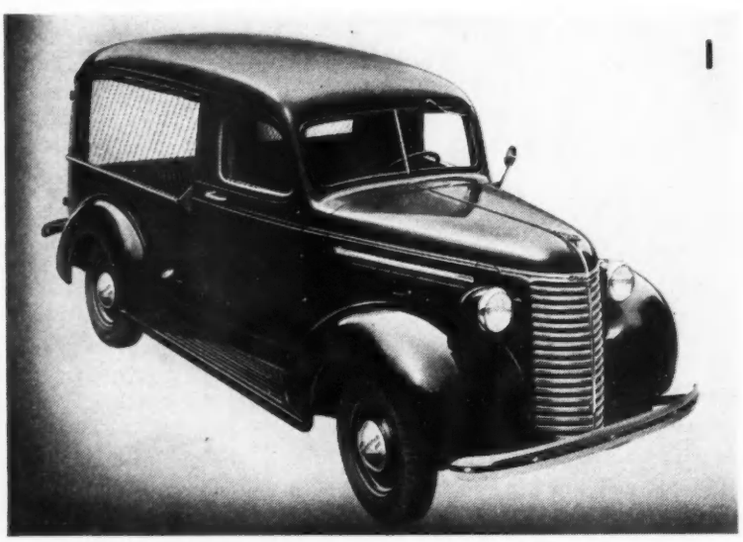
The designer and The Editors join in encouraging readers to make requests for designs of particular types of truck bodies. The present plan is to tie-in body designs with vocational buying periods. However, this plan is subject to change based on the desires of readers. Write Commercial Car Journal now what kind of body you would like to see designed.

CHEVROLET

RESTYLES ITS LINE AND ADDS NEW C.O.E. MODELS

Two-speed axles and power brakes optional on heavy-duty jobs . . . 39 models in line . . . longer wheelbases . . . 11 color options available



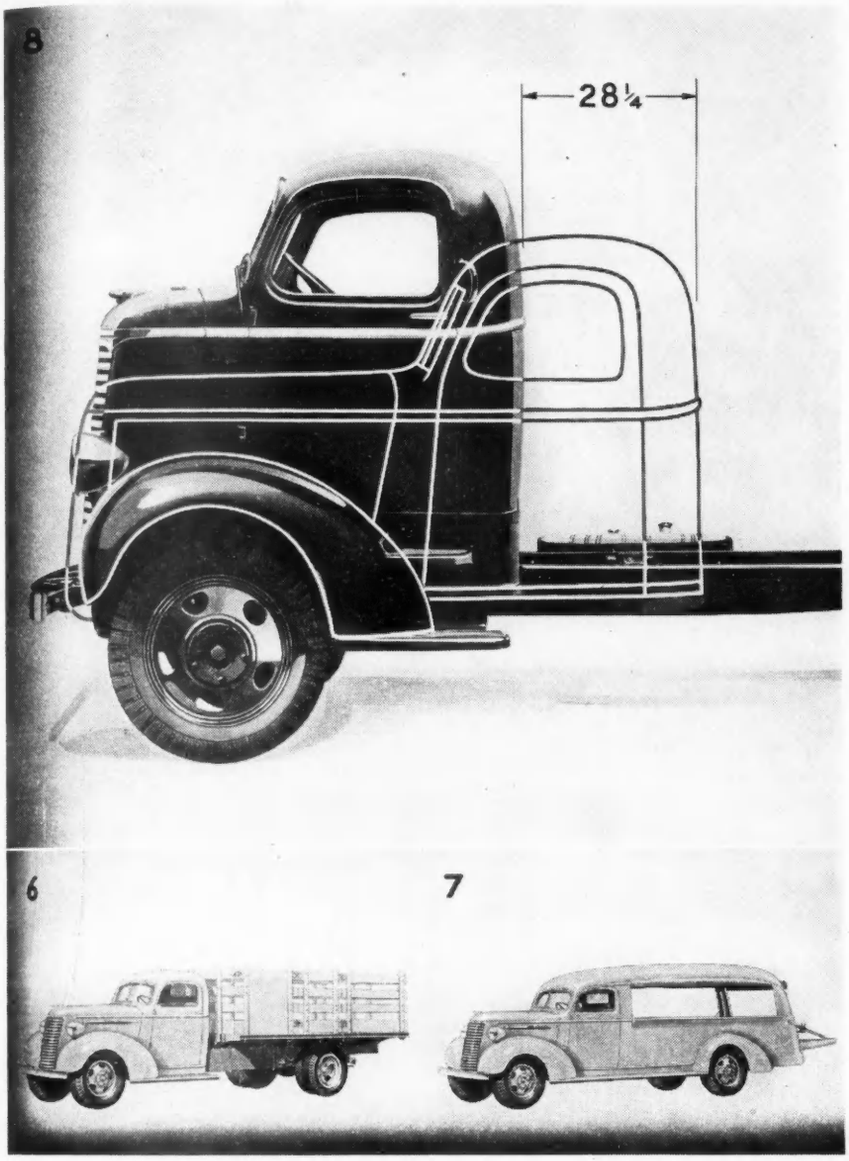


THERE are cab-over-engine models among the 39 types on eight wheelbases offered by Chevrolet for 1939. New features added this year are two-speed axles and optional power brakes. There are appearance changes including a color choice which comprises a range of 10 colors in addition to white. It is the broadest line ever offered in the history of the company.

Consideration of the driver is apparent in the design of the new cabs, not only of the conventional models but of the cab-over-engine series. In all units, seats are deeply cushioned, well padded, and extend full width, being 3 in. wider than heretofore,

SECTION 1

TRUCKS



Complete specifications of the new Chevrolets are published on page 46

1. The light delivery canopy model with screen sides is always popular.
2. New trim lines are revealed in the light delivery panel model for 1939.
3. The sedan delivery, available on the Master 85 chassis only is smartest of the entire commercial series.
4. The ¾-ton panel unit, introduced last year, reflects '39 improvements.
5. The light delivery pickup is one of the most versatile of all trucks.
6. The heavy-duty stake truck here shown on 158½ in. wheelbase chassis.
7. Heavy duty canopy express model.
8. The comparative silhouette of cab-over-engine and conventional models shows over-all length-saving advantages of the close-coupled type.

and enabling three men to sit abreast. Controls are conveniently grouped, steering wheel location and angle are carefully chosen, and the modern V-type windshield is of large area, affording full vision. Doors have a remote control handle which facilitates opening from inside.

All Chevrolet truck units will have a 1½-in. longer wheelbase in 1939. Wheelbases for the light delivery units will be 113¼ in.; for the ¾-ton, 123¾ in.; for the heavy-duty models, 123¾ in., 133 in., and 158½.

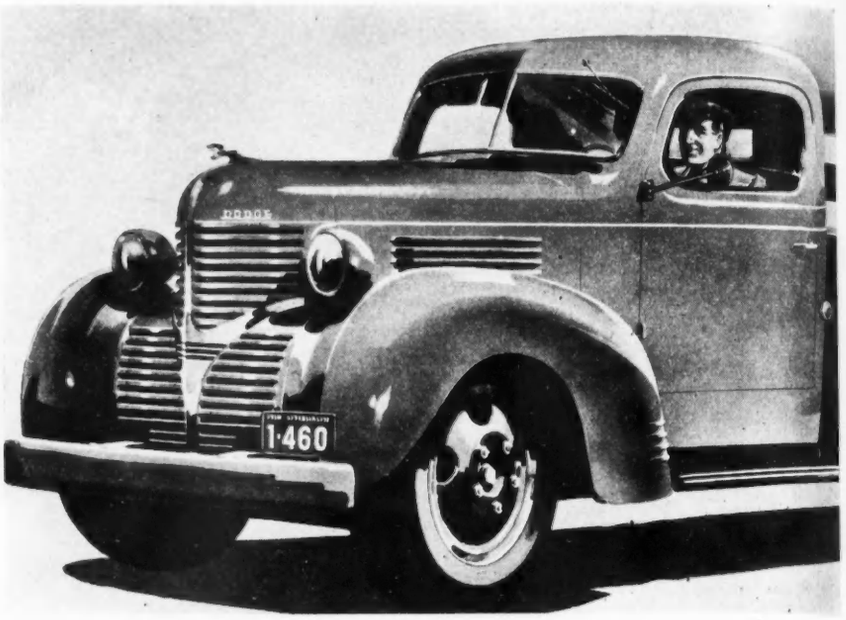
Running boards on all units are 1 in. wider to facilitate entering and leaving the cab, which this year is 1½ in. longer, 1¼ in. higher, and 1 in. wider. Side doors on panel models are 1 in. wider also. All bodies and cabs have 16 in. of foot room between the seat riser and the door hinge pillar, so there is no awkward maneuvering in entering or dismounting from the cab. Seat backs in the cabs are 3 in. lower and the cabs have been so designed as to give between 1 and 2 in. more head room. Softer springs will "give" for a maximum of about 2 in. more head space.

A more attractive instrument panel has been designed for the 1939 trucks, with the instruments clustered for easier reference. Choke and throttle controls have been recessed at the lower edge of the panel center. Windshield defroster openings are added on all instrument panels this year.

The clutch of the 1939 Chevrolet truck is the same type as in the passenger car line except for the throw-out bearings which are ball bearing on all but the ½-ton panel units, where they are the carbon block type. Ball bearings for the ½-ton can be added at extra cost.

Cab-over-engine models will be the highlight of the Chevrolet line, introduced this fall after several years' developmental work on this type of vehicle.

1



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DODGE

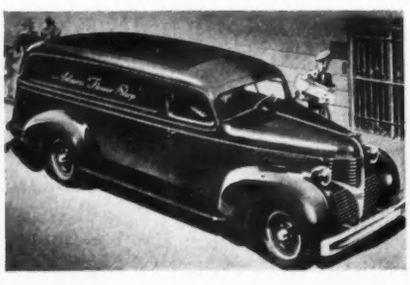
Drives at 1939 with improved styling and new engineering features which include two-speed axles and a diesel 3-ton model with Dodge-built engine

DODGE Truck Division of Chrysler Corp. features its 1939 line of trucks with a diesel engine for 3-ton models, two-speed axles and complete restyling of the entire line. The diesel engine is built by Dodge. It is a 4 cycle, 6 cylinder engine having 331 cu. in. piston displacement. Bore is 3¾ in. and stroke is 5 in. It has full length water jackets and 7 main bearings. It incorporates a simplified injector pump and anti-clog nozzles.

A radically changed grille and a sloping, one piece V-shaped windshield that opens, are front-end changes lending grace and symmetry to the new trucks. Their distinctive design will prove profitable as an excellent advertising medium. Modern appearing equipment publicly reflects "up-to-the-minute" business standards.

Of considerable interest and importance is the announcement that Dodge this year offers new Dual-Purpose models in 1½-ton heavy duty and 2-ton models for use where un-

4



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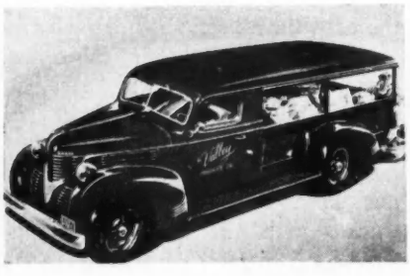

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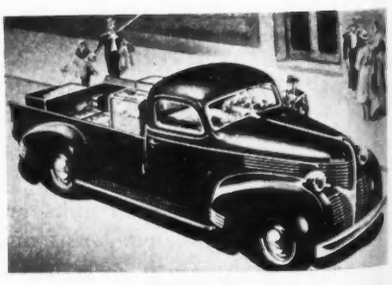

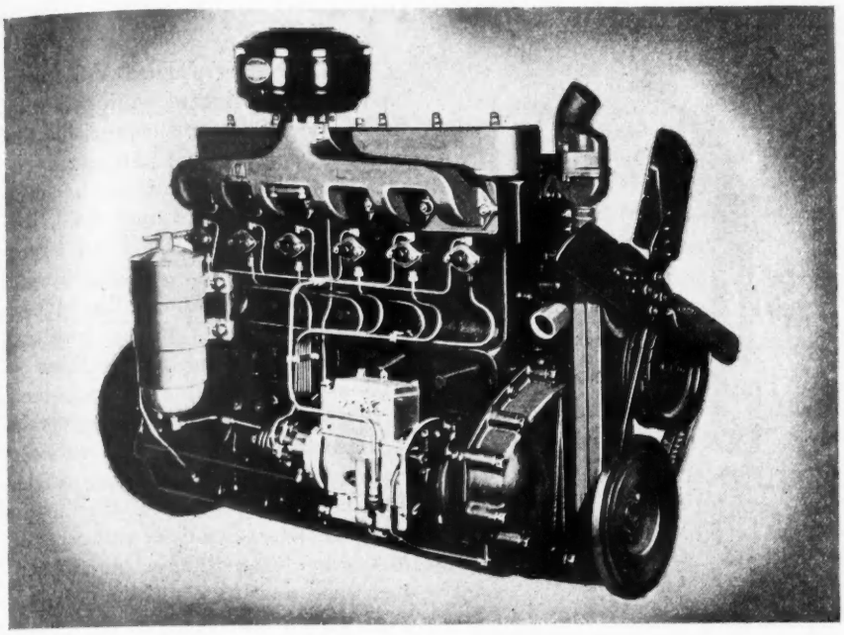

3

usual flexibility is required. A two-speed axle installed in the factory and available in two combinations of ratios, gives each model at least 8 speeds forward and 2 in reverse. Ratios are 5.14/7.15 and 5.83/8.1.

In addition to the new streamline styling, new features common to all 1939 trucks are the following: The cabs are larger and more comfortable; running board splash shields integral with cabs; fully skirted express and panel bodies; increased seat heights; windshields located for improved vision; cab upholstery is blue. Frame siderails will be extended to support a new channel type bumper without the use of intermediate brackets. This added support is strong enough to serve as an additional frame cross member. Longer life will be added to truck cabs, bodies and sheet metal because of a new type of stronger steel used in the trucks. This steel has 42,000 lbs. per square inch minimum elastic limit.

Time tested economy features of the truck 6-cylinder L-head engines, are continued in the 1939 motors. Six of the proved economy features common to all engines are: exhaust valve seat inserts; spray cooled exhaust valve seats; four piston rings; aluminum alloy pistons; full-length water jackets and positive oil cooling.

General technical and mechanical data of interest to truck buyers is listed as follows: Air cooled generator —air cooling improves performance because generator functions at a lower temperature. It also insures sufficient electrical power for normal operation.

By-pass thermostat—by-pass thermostat prevents water from circulating through radiator and recirculates it through the engine only until engine is warmed.

Vacuum spark control—automatic spark control in ½, ¾ and 1-ton trucks avoids spark knock, increases fuel economy at light engine loads.

Roller bearing universals—in place of plain bushings in universal joints, Dodge has roller bearings which require less lubrication, check backlash and deliver power to rear wheels more efficiently.

Full pressure lubrication—positive full pressure lubrication insures an ample supply of oil to bearings to save engine wear.

Air cleaner—the air cleaner keeps dust and grit from the engine.

Four bearing crankshaft—four bearings are used throughout to assure better support for the crankshaft. The 3-ton truck has 7 bearings.

Transmissions—three speed transmissions are standard equipment on the ½, ¾ and 1-ton trucks. 1½-ton trucks have 4 speed and 2 and 3-ton models have five speed transmissions. Special four speed transmissions are available for wide-range performance on ½, ¾ and 1-ton models.

Brake system—Dodge continues the use of hydraulic brakes. The emergency brake is a separate unit. Braking force is applied on the drive shaft.

Amola steel for vital parts—Amola steel is a new kind of alloy which is stronger and more resistant to stress and wear. It is used in axle shafts, springs and other essential parts.

Dimensions and pertinent facts peculiar to each of the truck models are as follows:

Body types in the ½-ton 116-in. wheelbase series are panel, pick-up, canopy and screen. New longer and wider express body (17 in. high, 78 in. long and 48¼ in. wide) permits easy loading of many standard commodities. The front springs have been increased from 36 to 39 in. The ½-ton Dodge truck has a hypoid rear axle. The axle shafts are made of Amola steel and tapered roller bearings are used throughout. Engines are mounted on rubber at front and rear to reduce vibration for driving comfort. The ½-ton trucks have optional rear axle ratios of 3.73, 4.1 and 4.78 at no extra cost.

Express, stake and platform are

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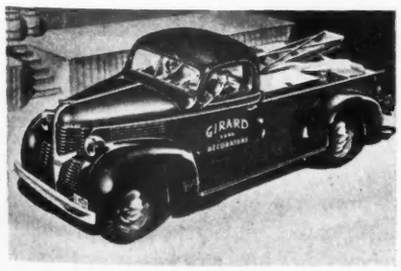
7



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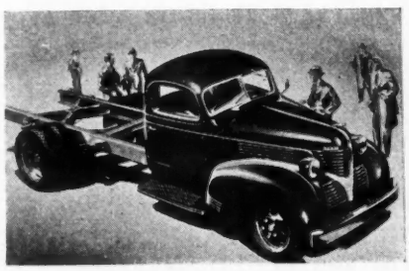
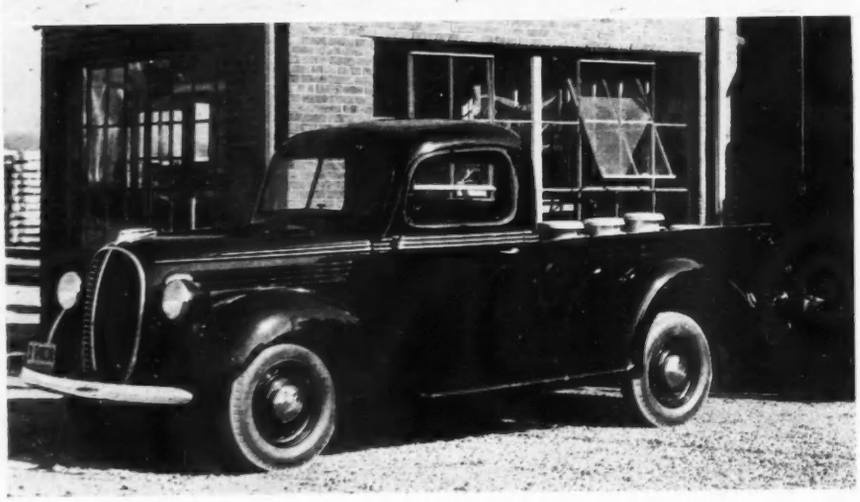


1. Wider cabs have improved visio
2. Radical changes mark new fronts
3. J. D. Burke inspects new diesel
4. The 1-ton panel, 6000 lb. gross
5. The canopy model has many uses
6. The ¾-ton express on 120 in. wb
7. The versatile new ½-ton pick-up
8. 1½-ton standard chassis and cab

FORD

1939 line includes new 95-hp. engine developing 170 lb.ft. torque at 2100 r.p.m., hydraulic brakes, improved 85-hp. powerplant, and comprises widest selection of capacities, ratios and power ever offered



A 1939 line of Ford V-8 trucks and commercial cars equipped with hydraulic brakes and comprising the widest selection of capacities, gear reduction ratios and power it has ever offered the transportation field, has been announced by the Ford Motor Co.

With 42 body and chassis types, two clutches, five transmissions and eight rear axle ratios, in addition to various wheel and tire sizes which may be chosen, operators may obtain V-8 trucks and commercial cars for their own particular commercial transportation problems. The line is designed to meet the requirements of more than 90 per cent of all commercial operations.

Hydraulic brakes are engineered to conform with Ford design and practice, insuring quick stops with easy pedal pressure.

Three V-8 engines are available for 1939. Heading the list is the new 95-h.p. engine with piston displacement of 239 cu. in. Its bore is 3.185 in. and its stroke 3.75 in. and it develops a torque of 170 lb.-ft. at 2100 r.p.m. Main bearings 2.5 in. in diameter have a total bearing surface of 36.81 sq. in. The improved 85 and 60 hp. engines complete the line.

A number of refinements have been made in the 85-h.p. engine. The crankshaft is larger and heavier with diameter of main bearings increased to 2½ in. Another change this year is the use of tungsten steel valve seat inserts for all valves in both the 85 and 95-h.p. engines. Previously valve seat inserts were used only for exhaust valves. New type piston rings in all engines provide increased oil economy.

The 112-in. wheelbase chassis has wide applicability through use of the 85 and 60-h.p. engines, three transmissions and three rear axle ratios. A 4.44 to 1 rear axle ratio is used with the 60-h.p. engine and a 3.78 to 1 rear axle ratio with the 85-h.p. engines. An optional rear axle ratio of 4.11 to 1 is also available.

There is a choice between the low reduction 3-speed transmission ordinarily used with the 60-h.p. engine and the standard 3-speed transmission ordinarily used with the 85-h.p. engine. There is also a 4-speed transmission. The chassis is available with panel, stake, platform, pickup, sedan delivery bodies, as chassis with cab

and in two driveaway types.

A list of selections also prevails for the 122-in. wheelbase one-ton truck. It is available with the 60-h.p. engine and a 6.67 to 1 rear axle ratio and the 85-h.p. engine with a 4.86 to 1 rear axle ratio. A heavy duty 4-speed transmission or either of two special 3-speed transmissions may be used with the 85-h.p. engine and a 4-speed transmission with the 60-h.p. engine.

The 1-tonner is available with panel, express, stake and platform bodies, as chassis with cab and in two driveaway types.

A choice of either the 85 or 95-h.p. engine is available with the 134-in. wheelbase and 157-in. wheelbase conventional trucks and all cab-over-engine trucks.

There is also a choice between rear axle ratios of 5.14 to 1, 5.83 to 1 and 6.67 to 1. If still lower reductions are desired, a two-speed axle is offered with dual ratios of 8.11 to 1 and 5.83 to 1.

The conventional 134-in. wheelbase chassis is available with panel, stake and platform bodies, as cab and chassis and in two driveaway types. The 134-in. wheelbase dump chassis is available with dump body, as cab-and-chassis and in two driveaway types. A 191-in. wheelbase chassis for school bus use is available in a driveaway type.

The 157-in. wheelbase chassis is available with stake and platform body, as cab-and-chassis and in two driveaway types.

Introduced last spring, the line of Ford cab-over-engine trucks has been expanded by the addition of a 157-in. wheelbase unit. It is available as chassis with cab, and in a driveaway type.

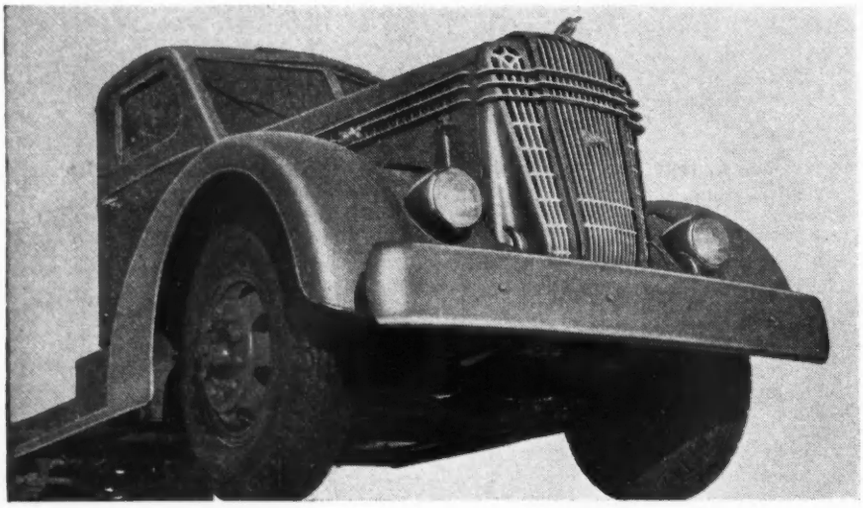
The 134-in. wheelbase cab-over-engine chassis is available with stake and platform body, as chassis with cab and in two driveaway types.

The 101-in. wheelbase cab-over-engine chassis is available with dump, stake and platform bodies and in a driveaway type.

The new rear brakes on the 134 and 157-in. wheelbase and cab-over-engine units have been increased in size from 15⅛ by 2½ in. to 15 by 3½ in. Front brakes are 14 by 2 in. The hand brake system is completely independent, operating separate 14

(Turn to Page 120, Please)

Below, top: The stake body on the 157-in. wheelbase which is also available with platform body, both as cab and chassis and in two driveaway types. Below, bottom: The sedan delivery, with hydraulic brakes is available with 60 or 85-hp. engines. Opposite page, top: The new Ford dump body on conventional chassis. It is available with either 85 or 95 hp. engines. Brakes are hydraulic. Opposite page, bottom: The pickup on the 112-in. wheelbase chassis is available with 60 or 85-hp. engines and three rear axle ratios

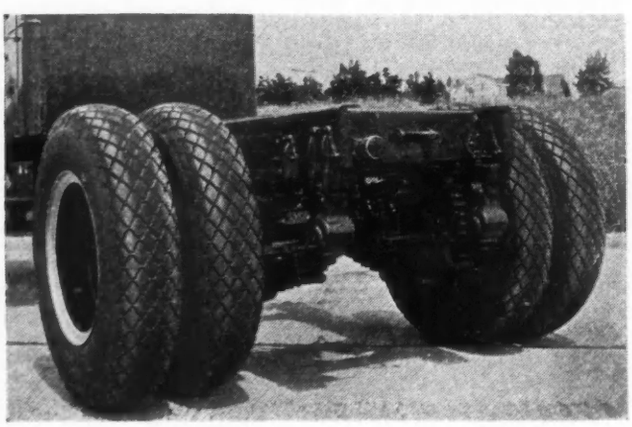


Distinctive lines and a matched-color grille mark the model J's front end

STERLING

Presents J series embodying eye appeal for transport work, H series with heavy-duty construction for off-the-road jobs

Some H models have chain drive and narrow track axle



STERLING MOTORS CORP. introduces the Model J, a new truck of refined appearance for transport duty, and the Model H, featuring simplicity of design and heavy duty construction for off the highway work.

The "J" construction embodies refinements and has truly distinctive eye appeal. Incorporated in the radiator grille, fenders, hood, and cab are sturdiness and simplicity of design. The fenders are made of heavy gage steel and are readily removable, providing maximum accessibility. The hood is gracefully formed and securely held in position by means of heavy-duty hood latches.

The radiator grille is smart in appearance and is finished to match the trim on the hood sides. Attractiveness of the "J" models is further emphasized by the deluxe streamlined cab. The two-piece, V-type, sloping windshield affords maximum visibility. The fuel tank is mounted at the frame side under the runboard apron.

The "H" models lend themselves exceptionally well to dump and off the highway operations. Sturdy in appearance and construction, they are also preferred by some transport operators because of their simplicity and because the front axles are set back, resulting in shorter wheelbase.

The radiator, fenders, running boards, and hood, which may be damaged, are ruggedly constructed, and if necessary, can be readily replaced. The radiator upper and lower tanks are bolted to the core, making replacement, if necessary, simple and less costly. A heavy-duty guard protects the radiator.

Maximum accessibility of the engine is obtainable by removing the fenders. The running boards have non-skid surfaces, and are mounted independently of the fenders. The hood is fitted with ventilating doors. A heavy-duty channel bumper is rigidly attached to the sidemembers of the frame. The fuel tank is mounted under the seat.

The deluxe cab is sturdy in construction and is designed to resist road shocks. Frame twists are not transmitted to the cab because of the

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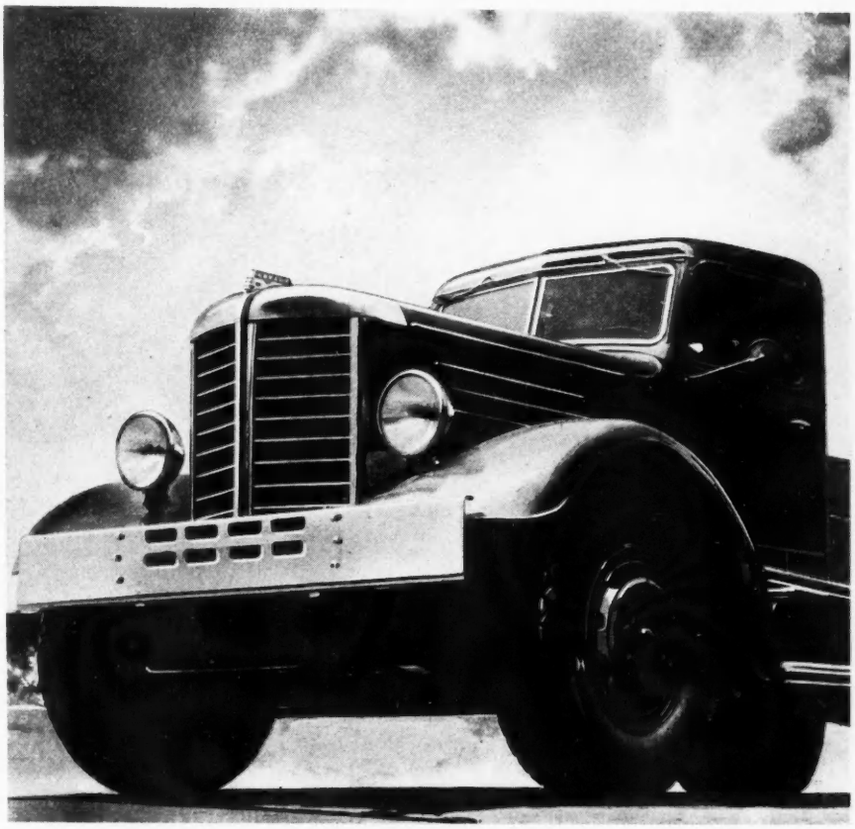

FEDERAL

SUPER HEAVY DUTIES

Four 6 to 8-ton models making their maiden appearance are styled to emphasize sturdiness and durability

THE Federal Motor Truck Co., Detroit, announces four new models of the super heavy-duty type having 6 to 8-ton capacity. The Models 62, 63, 65 and 66 present a front end of massive sturdy beauty in keeping with the character of trucks of this size and capacity. The heavy radiator shell, grille and bumper, all of which are chromium plated, emphasize the strength built into these trucks.

These models vary in wheelbase from 141 in. to 211 in. to accommodate bodies of up to 18 ft. in length. Models 62 and 65, weighing 10,400 and 11,300 lb. respectively, are powered with a Continental 22R 6-cylinder valve-in-head engine of 4½-in. bore by 5¼-in. stroke developing 138 hp. This engine has a 7-bearing crankshaft of heat treated, chrome vanadium steel. Delco-Remy 12-volt dual ignition is employed with two heavy-duty air-cooled bus type coils and two sets of spark plugs.

Axles front and rear are Timken. The rear axles are of the double reduction type, the No. 76746W being used on the Model 62 and the 79733W on the Model 65. Both models are equipped with a Clark 326VO overdrive five-speed transmission and Westinghouse air brakes are standard equipment. Other mechanical features common to 62 and 65 models are 10 3/16-in. pressed steel frame, W. C. Lipe 14-in. single plate clutch, roll bearing universal joints, radius rods, 50-gal. side mounted gas tank with outside filler.

The general specifications of the 63 and 66 models are the same as the 62 and 65 with the exception of the engine which is a 6SRK Waukesha 6-cylinder, 7-bearing, L-head type of 4⅝-in. bore x 5⅛-in. stroke developing 115 hp.

In addition there will be the line of lighter models from ¾ to 5-ton capacity, another group of heavy-duty models from 4 to 7½ tons in size, and a group of cab-over-engine trucks carrying ratings of 1½ to 5 tons. Completing the line are ten 6-wheel models in conventional and cab-over-engine types from 4 to 8 tons capacity.

The entire line, with the exception of the heavy-duty and cab-over-en-

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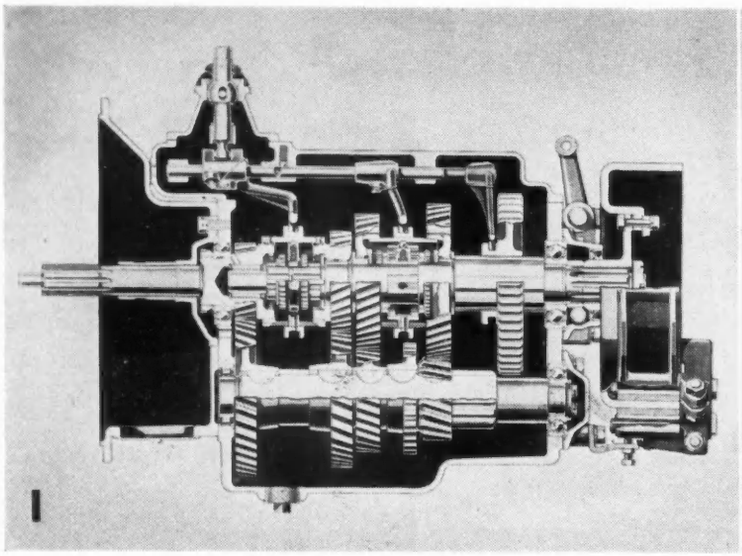
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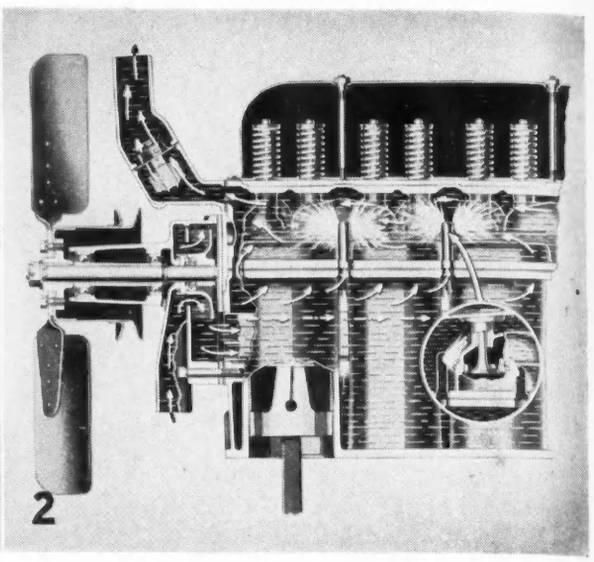
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GENERAL MOTORS *Truck*

Loads up for 1939 with new styling, factory-built overhead-valve engines, 10 two-cycle diesel models, syncromesh transmissions and other new mechanical features

A COMPLETE line of entirely new overhead-valve gasoline engines, 10 models incorporating the new two-cycle diesel engines and syncromesh transmissions for medium and heavy duty trucks feature the presentation of the new line of trucks announced by General Motors Truck and Coach for 1939. All models have a new pleasing appearance. Specifications of the new models are printed elsewhere in this issue.

Among the outstanding features of the new line are new cabs on light-duty models, which are larger, roomier, safer—all with V-type windshields. Distinctive in appearance, the streamlined cab blends with the over-all design to suggest a combination of power and utility.

Bigger, sturdier bodies improved in construction, a distinctive color treatment which enhances the appearance value of the new chrome-finished grille, high-compression engines for all light, medium and heavy duty trucks factory-built for the first time in the company's 39-year history—these and other features mark the 1939 truck line as entirely new.

The new and bigger factory-built overhead valve engines have an extremely high ratio of torque to displacement. Displacement has been increased up to 30 cu. in. and their design includes all the latest features.

Compression ratio increase averages 20 per cent. An example of

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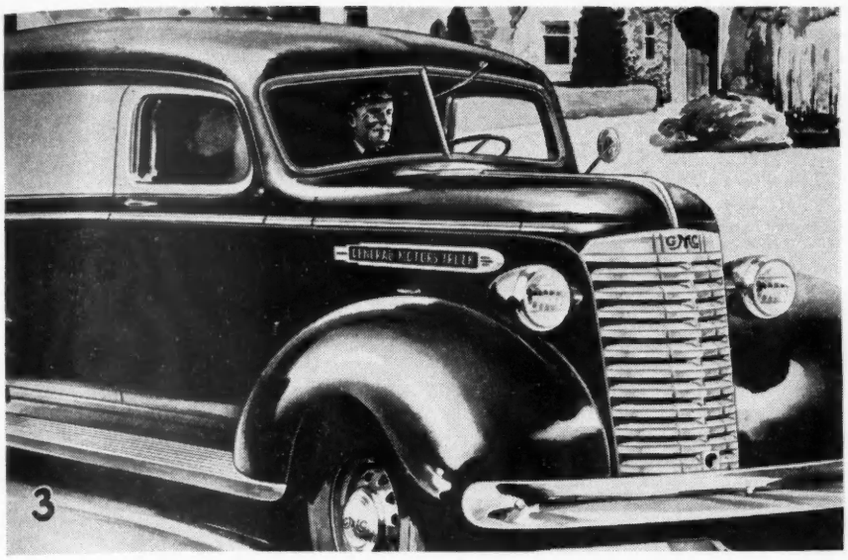
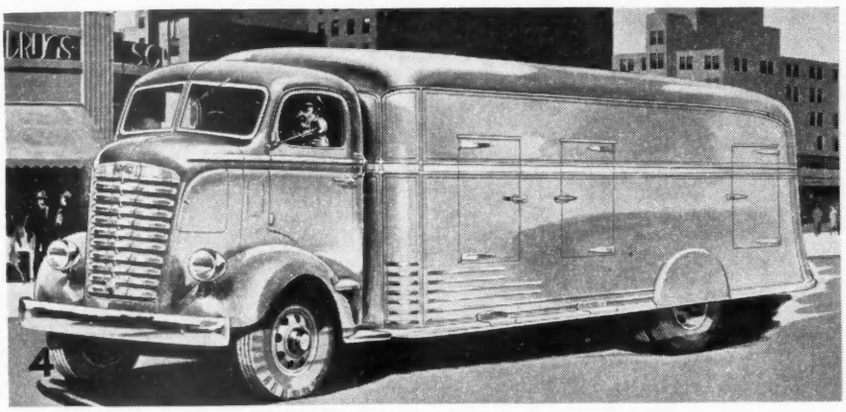
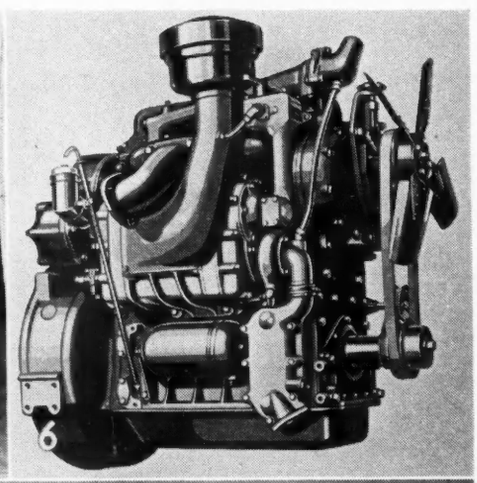
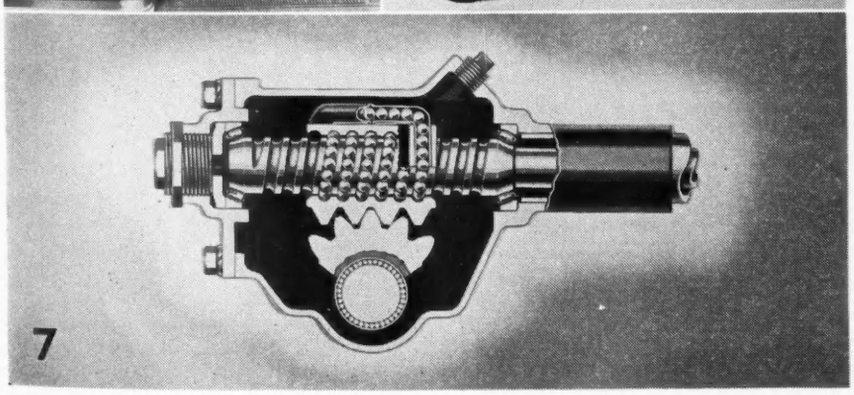








1. GM's new syncromesh transmission is of the five-speed underdrive type.

2. Directed water cooling includes pressure spray to exhaust passages.

3. Model AC-150 is typical of the handsome new light-delivery fleet.

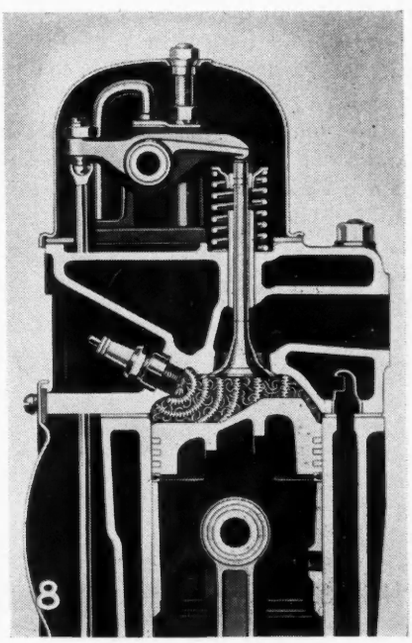
4. Model AF-350, 1½ to 4 tons, reflects new streamlining of the C.O.E. models.

5. Neat interiors, free from any obstruction mark cabs of light models.

6. The two-cycle 3-cylinder diesel is small, light, remarkably smooth.

7. New ball bearing nut and sector steering aids large unit handling.

8. Dome pistons give high turbulence, are used with high compression ratios.



WHITE Horse

Is new retail delivery model with 4-cylinder air-cooled engine mounted at the rear . . . Patented cab seat for all models, another innovation . . . New White engine in 318 cu. in. size uses advanced features

THE White Motor Co. announces the "White Horse," a new package car powered by a 150 cu. in. air-cooled engine mounted amidships, cab seats sprung independently of the cab for all models and a new 318 cu. in. L head engine.

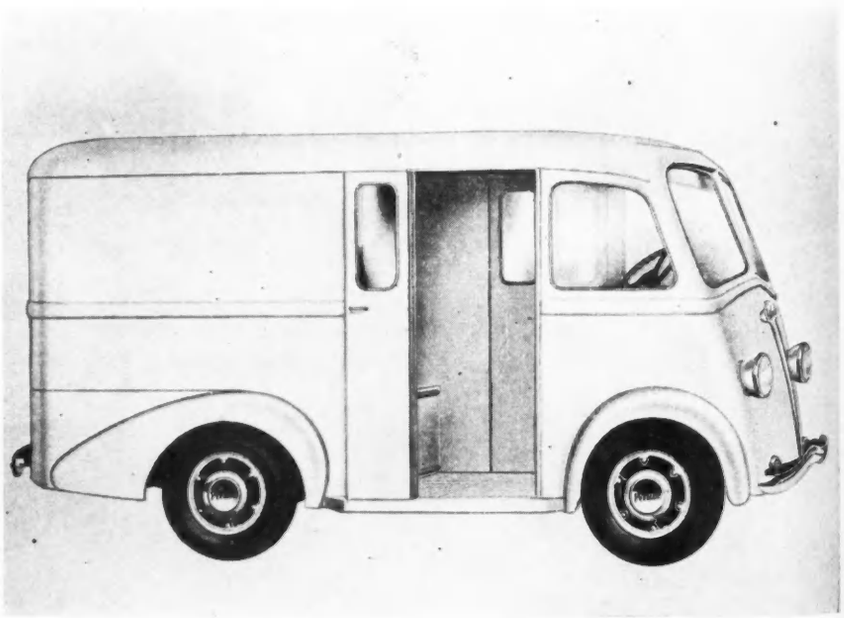
The power plant of the package car is the four cylinder opposed engine manufactured by Air Cooled Motors Corp. It has a bore of 3⅝ in. and a stroke of 3⅝ in. The horsepower is 45 at 2500 r.p.m. In this installation the engine, transmission and rear axle are designed in one integral unit. Coil springs generally similar to those used for independent front wheel suspension in passenger cars provide suspension for the rear of this truck. A 10 in. power operated clutch is used with a three speed transmission.

The rear axle is full floating with one piece steel housing and has a gear ratio of 6.5 to 1. The rear axle, transmission and engine together with the spring suspension can be removed as a unit.

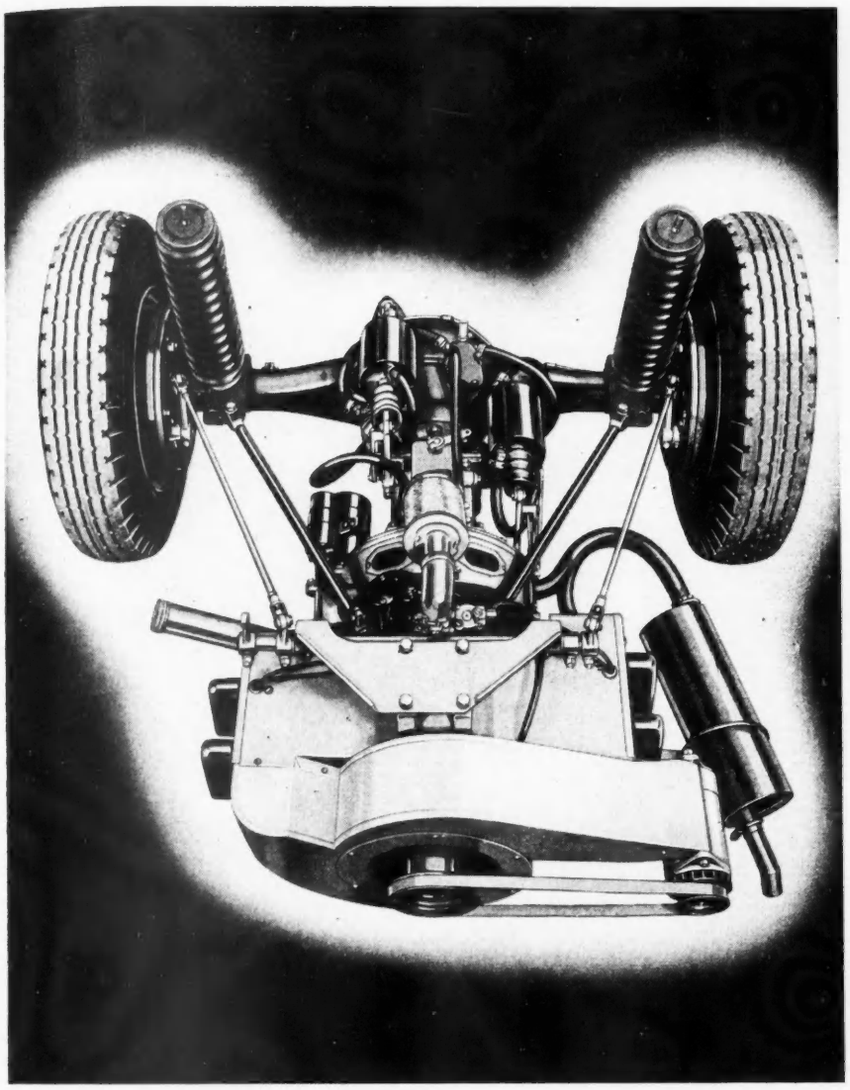
The body has air cell insulation. It is of welded design with integral supporting frame. The vehicle can be furnished in two wheelbases, 93 in. and 110 in. Turning radius is 15 ft. and the total weight of the vehicle ready for the road is 3100 lb.

Brakes are the same size front and rear and are hydraulically operated. Front springs are semi-elliptical and the coil springs in the rear have rubber bushed stabilizer arms. Steering is of the cam and lever type and 7.00/16 tires with singles rear are standard equipment. Available are 7.50/16 tires.

The vehicle is designed to run 33 m.p.h. but higher speeds can be obtained by change of rear axle ratio for special services. The 13 gal. gas tank is located at the rear. All normal servicing of the engine can be carried out from one point.



The welded all-steel body of the White Horse has air-cell insulation and an integral supporting frame



The self contained air-cooled power unit of the White Horse develops 45 hp.

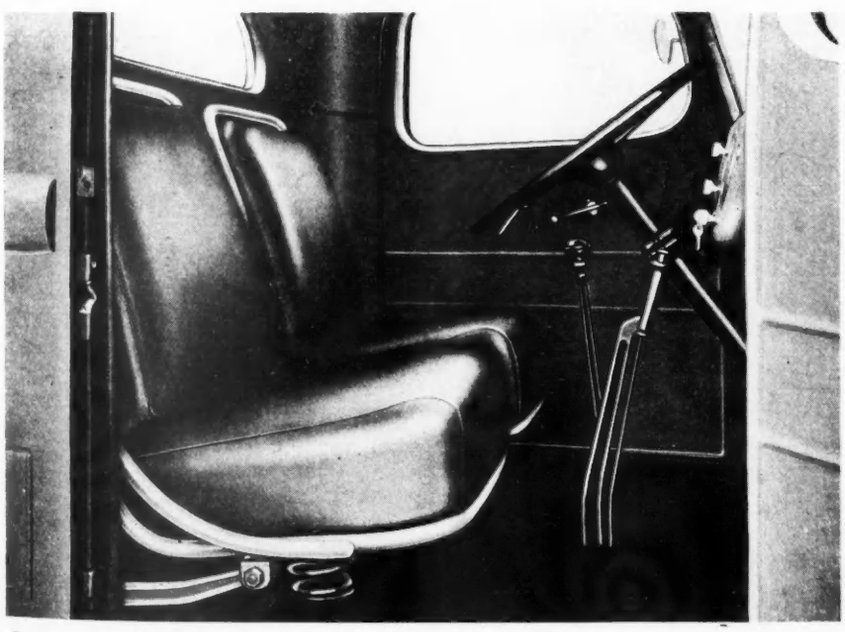
The new cab seats are of tubular construction and centrally suspended from the cab floor by heavy alloy steel coil springs supported by steel arms to the cab rear support. The ride control arms are mounted on rubber bushings which act as shock absorbers to prevent excessive bouncing and adjustment of the ride control arms can easily be made to give proper action for any driver weight. The effect is to cradle the driver and at the same time the tubular frame construction allows circulation of air around the driver.

Genuine leather upholstery is used with double interlaced coil springs in the seat cushion proper. Seats are adjustable and with the back and seat moving in unison all friction from the driver's back is eliminated. This eliminates a common driver complaint. These seats are available on all 1939 White trucks.

The 318 cu. in. engine has the same 3⅞-in. bore and all of the mechanical features of the 362 cu. in. engine which was described in detail in the January, 1938, issue of COMMERCIAL CAR JOURNAL. The 318 cu. in. engine has a stroke of 4½ in. and has a horsepower of 110 at 3000 r.p.m.

This engine has the new intake manifold with straight smooth passages graduated in size to insure even distribution. It is fed by a dual carburetor each throat supplying three cylinders. Cylinder head bolts are in threaded columns extending clear down to the crankcase to prevent distortion and the engine has a directional flow cooling system. Copper-lead bearings are used throughout and the aluminum alloy pistons have five piston rings.

Tocco-hardened crankshaft is used and zero lash hydraulic valve lifters are incorporated. The water pump is of the packless type and camshafts have the grenodizing surface treatment to prevent scuffing of valve lifters.



Tubular frames, central-support coil springs and adjustable ride control arms are features of the new seats

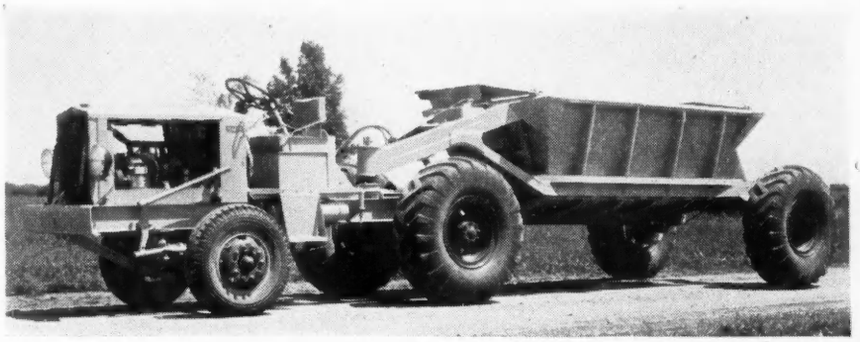
SPECIFICATIONS OF NEW TRUCK MODELS DESCRIBED IN THIS ISSUE

Line Number	MAKE AND MODEL	GENERAL (See Keynote)						TIRE SIZES (D-dual rear, S-single rear)		ENGINE DETAILS							Governor Standard	TRANSMISSION		REAR AXLE				FRONT AXLE	BRAKES						C-A Dimension (Std. W. B.)	FRAME	
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight with Max. Tires	Chassis Wt. (Stripped)	Standard Front and Rear	Maximum Tire Size Furnished	Make and Model	No. of Cylinders, Bore and Stroke	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at R.P.M. Given	Main Bearings: Number, Diameter and Length		Make and Model	Forward Spds'	Make and Model	Gear and Type	Drive & Torque	Gear Ratio Range in High	Make and Model	SERVICE: Make Location Type Operat'n	Lining Area	Drum Area	Drum Material	Hand Location Type		Side Rail Dimensions	Type
1	Chevrolet. Mas JC	½	***	113	113	4600	2240	6.00/168	15–6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	3	Own	S ½	U	4.11*3.82	Own	O4IH	158	288	a	2I	38 ¼	5 ¾x2 ¼x ⅜	C
2	.....Mas. JD	¾	***	123	123	5200	2415	15–6S	15–6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	3	Own	S ½	U	**–4.11	Own	O4IH	158	288	a	2I	48 ¼	5 ¾x2 ¼x ⅜	C
3	.....Mas. JE	¾	***	123	123	5800	2570	7.00/17S	7.50/17S	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	3	Own	S ½	U	**–4.11	Own	O4IH	194	353	a	2I	48 ¼	5 ¾x2 ¼x ⅜	C
4	.....Mas. 1	1	***	133	133	6700	3020	6.00/20S	6.00/20S	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	537	P	2I	57 ¾	7x2 ⅝x ½	C
5	.....Mas. VA	1 ½	***	133	133	8000	3105	6.00/20†S	32x6S	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	537	P	2I	57 ¾	7x2 ⅝x ½	C
6	.....Mas. VB	1 ½	***	133	133	9500	3190	6.00/20D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	537	P	2I	57 ¾	7x2 ⅝x ½	C
7	(g) Mas. Spec. VB	1 ½	***	133	133	13500	3450	6.50/20D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Own	O4IH	330	532	P	2I	57 ¾	7x2 ⅝x ½	C
8	.....Mas. VC	1 ½	***	158	158	8000	3155	6.00/20†S	32x6S	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	532	P	2I	83 ¼	7x2 ⅝x ½	C
9	.....Mas. VD	1 ½	***	158	158	9500	3240	6.00/20D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	532	P	2I	83 ¼	7x2 ⅝x ½	C
10	(g) Mas. Spec. VD	1 ½	***	158	158	13500	3500	6.50/20D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Own	O4IH	330	532	P	2I	83 ¼	7x2 ⅝x ½	C
11	.....(c.o.e.) VE	1 ½	***	107	107	8000	.....	32x6†S	32x6S	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	532	C	2I	62 ½	7x2 ⅝x ½	C
12	.....(c.o.e.) VF	1 ½	***	107	107	9500	.....	32x6D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	532	C	2I	62 ½	7x2 ⅝x ½	C
13	(coe) Mas. S. VF	1 ½	***	107	107	13500	.....	32x6D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Own	O4IH	330	532	C	2I	62 ½	7x2 ⅝x ½	C
14	..(coe) Mas. VG	1 ½	***	131	131	8000	.....	32x6†S	32x6S	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	532	C	2I	86	7x2 ⅝x ½	C
15	(c.o.e.) Mas. VH	1 ½	***	131	131	9500	.....	32x6D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.43–6.17	Own	O4IH	330	532	C	2I	86	7x2 ⅝x ½	C
16	(coe) Mas. S. VH	1 ½	***	131	131	13500	.....	32x6D	32x6	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Own	O4IH	330	532	C	2I	86	7x2 ⅝x ½	C
17	E (coe) TG157H	.....	***	156	156	17000	4580	6.00/20D	34x7	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	5.14–7.15	Tim 31021H	WO4IH	339	570	C	2I	111 ½	7 ⅛x2 ½ x¼	C
18	.....(E) BG183	.....	***	183	183	14800	4375	6.00/20D	7.50/20	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Tim 31021H	WO4IH	339	532	C	2I	.....	7 ⅛x2 ¾x ⅜	D
19	.....(E) BG185	.....	***	185	185	13500	3950	6.00/20D	7.50/20	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Own	O4IH	330	532	C	2I	.....	7 ⅛x2 ¾x ⅜	D
20	.....(E) BG144	.....	***	144	144	16700	4310	9.00/18D	7.50/20	Own	6–3 ½x3 ¾	216	6.2	170	78–3200	4–2 ¾x5 ⅞	N	Own	4	Own	SF	U	**–6.17	Tim 35000	WO4IH	.....	.....	C	2I	.....	7 ⅛x2 ½ x¼	C
21	Dodge.....TC	½	***	116	.....	.....	.....	6.00/16S	6.50/16S	Own	6–3 ⅛x4 ⅜	201	6.7	148	70–3000	4–2 ¼x5 ½	N	N.P.	3	Own	Hy ½	H	3.73–4.78	Own	O4IH	148	251	C	TX	40 ½	6x2x ⅛	C
22	.....TD15	¾	***	120	.....	.....	.....	TA–15S	TA–15S	Own	6–3 ¼x4 ⅜	217	6.5	158	77–3000	4–2 ½x5 ½	N	N.P.	3	Own	Hy ½	H	3.73–4.4	Own	O4IH	154	264	C	TX	44 ½	6 ⅛x2 ⅜x ⅜	C
23	.....TD20	1	***	120	133	.....	.....	7.0/16††S	7.50/16S	Own	6–3 ¼x4 ⅜	217	6.5	158	77–3000	4–2 ½x5 ½	N	N.P.	3	Own	S ½	H	3.9 –4.78	Own	O4IH	190	293	a	TX	44 ½	6 ½x2 ⅛x ⅜	C
24	.....TE20	1	***	126	160	.....	.....	6.00/20†S	7.00/20S	Own	6–3 ⅜x4 ¼	218	5.8	150	73–3000	4–2 ½x5 ½	N	N.P.	4	Own	SF	H	4.87–5.85	Own	O4IH	190	310	a	TX	51 ⅛	6 ½x2 ½x ⅜	CX
25	.....TE30	1 ½–2	***	126	160	.....	.....	6.00/20†S	7.00/20	Own	6–3 ⅜x4 ¼	218	5.8	150	73–3000	4–2 ½x5 ½	N	N.P.	4	Own	SF	H	4.87–5.85	Own	O4IH	190	310	a	TX	51 ⅛	6 ½x2 ½x ⅜	CX
26	.....TF35	1 ½–2	***	126	190	.....	.....	6.00/20†S	7.50/20	Own	6–3 ⅜x4 ¼	228	5.8	158	78–3000	4–2 ½x5 ½	N	N.P.	4	Own	SF	H	5.12–6.33	Own	O4IH	263	406	a	TX	51 ⅛	7x2 ½x ½	CX
27	.....TG40	1 ½–4	***	136	220	.....	.....	6.50/20D	8.25/20	Own	6–3 ⅜x4 ½	242	5.6	175	85–3000	4–2 ½x5 ½	Y	Cla	5	Own	HyF	H	5.11–7.16	Own	O4IHV	322	502	a	TX	60 ½	8 ⅛x2 ½ x ½	CX
28	.....TH45	2–4	***	136	220	.....	.....	7.00/20D	8.25/20	Own	6–3 ⅜x4 ½	242	5.6	175	85–3000	4–2 ½x5 ½	Y	Cla	5	Own	HyF	H	5.11–7.16	Own	O4IHV	322	502	a	TX	60 ½	8 ⅛x2 ½ x ½	CX
29	.....TL50	2–5 ½	***	152	205	.....	.....	32x6D	9.75/20	Own	6–3 ¾x5	331	5.2	230	100–2800	7–3x12 ½	Y	Cla	5	Tim	SF	H	6.16–7.40	Tim	O4IHV	421	685	a	TX	66 ½	8 ½x2 ½x ⅜	CX
30	...(c.o.e.) RO55	2–5 ½	***	96	140	.....	.....	32x6D	9.75/20	Own	6–3 ¾x5	331	5.2	230	100–2800	7–3x12 ½	Y	Cla	5	Tim	SF	H	6.16–7.40	Tim	O4IHV	421	685	a	TX	76 ½	8 ½x2 ½x ⅜	CX
31	.....TK60	3–5 ½	***	152	205	.....	.....	8.25/20D	9.75/20	Own	6–3 ¾x5	331	5.2	230	100–2800	7–3x12 ½	Y	Cla	5	Tim	SF	H	6.16–7.40	Tim	O4IHV	421	685	a	TX	66 ½	8 ½x2 ½x ⅜	CX
32	....(c.o.e.) RP65	3–5 ½	***	96	140	.....	.....	8.25/20D	9.75/20	Own	6–3 ¾x5	331	5.2	230	100–2800	7–3x12 ½	Y	Cla	5	Tim	SF	H	6.16–7.40	Tim	O4IHV	421	685	a	TX	76 ½	8 ½x2 ½x ⅜	CX
33	Federal.....62	6–7 ½	***	141	211	.....	10400	10.50/20D	11.25/24	Con 22R	6–4 ½x5 ¼	501	4.5	365	138–2400	7–2 ¾x14 ⅛	Y	Cla 326VO	5	Tim 76746W	2F	R	7.89–9.2	Tim36000TW	Ws4IA	620	921	a	TD	60	10 ⅛x3 ⅛x ⅜	TF
34	63	6–7 ½	***	141	211	.....	10250	10.50/20D	11.25/24	Wau 6SRK	6–4 ⅝x5 ½	517	4.6	350	115–2400	7–3x13 ⅞	Y	Cla 326VO	5	Tim 76746W	2F	R	7.89–9.2	Tim36000TW	Ws4IA	620	921	a	TD	60	10 ⅛x3 ⅛x ⅜	TF
35	65	6–8	***	141	211	.....	11300	10.50/24D	11.25/24	Con 22R	6–4 ½x5 ¼	501	4.5	365	138–2400	7–2 ¾x14 ⅛	Y	Cla 326VO	5	Tim 79733W	2F	R	8.59–10.11	Tim36000TW	Ws4IA	724	1051	a	TD	60	10 ⅛x3 ⅛x ⅜	TF
36	66	6–8	***	141	211	.....	11150	10.50/24D	11.25/24	Wau 6SRK	6–4 ⅝x5 ½	517	4.6	350	115–2400	7–3x13 ⅞	Y	Cla 326VO	5	Tim 79733W	2F	R	8.59–10.11	Tim36000TW	Ws4IA	724	1051	a	TD	60	10 ⅛x3 ⅛x ⅜	TF
37	General (4) AC-100	½	***	113	123	.....	2390	6.00/16S	15-7.50S	Own 228	6–3 ⅛x3 ⅛	228	6.2	.....	.....	4–2 ⅛x4 ⅛	N	Own	3	Own	S ½	U	**–4.11	Own	O4IH	168	242	c	2I	38 ¼	5 ¼x2 ¼x ⅜	C
38	Motors..AC-150	¾	***	123	.....	.....	2560	7.00/15S	15-7.50S	Own 228	6–3 ⅛x3 ⅛	228	6.2	.....	.....	4–2 ⅛x4 ⅛	N	Own	3	Own	S ½	U	**–4.11	Own	O4IH	168	242	c	2I	48 ½	5 ½x2 ⅜x ⅜	C
39	.....AC-251	1–1 ½	***	113	.....	.....	2815	7.00/16S	7.00/16	Own 228	6–3 ⅛x3 ⅛	228	6.2	.....	.....	4–2 ⅛x4 ⅛	N	Own	3	Own	SF	H	4.57–5.14	Own	O4IH	200	297	eC	2I	57 ¾	6 ⅛x2 ¾x ⅜	T
40	.....AC-252	1–1 ½	***	133	.....	.....	2870	7.00/16S	7.00/16	Own 228	6–3 ⅛x3 ⅛	228	6.2	.....	.....	4–2 ⅛x4 ⅛	N	Own	3	Own	SF	H	4.57–5.14	Own	O4IH	200	297	eC	2I	57 ¾	6 ⅛x2 ¾x ⅜	T
41	.....AC-300	1 ½–3 ½	***	133	158	.....	3570	6.00/20†S	7.50/20	Own 228	6–3 ⅛x3 ⅛	228	6.2	180	80–3000	4–2 ⅛x4 ⅛	N	Own	4	Own	SF	H	5.67–6.20	Own	O4IH	337	478	C	2I	57 ¾	7x2 ⅝x ½	T
42	.....AC-350	1 ½–4	***	133	193	.....	4270	6.00/20†S	8.25/20	Own 228	6–3 ⅛x3 ⅛	228	6.2	180	80–3000	4–2 ⅛x4 ⅛	N	Own	4	Own	SF	H	5.67–6.67	Own	O4IH	340	478	C	2I	60	8x2 ½x ½	T
43	.....AC-400	1 ½–4 ½	***	133	193	.....	4450	6.00/20D	34x7	Own 248	6–3 ⅛x3 ⅛	248	6.2	196	88–3000	4–2 ⅛x4 ⅛	Y	Own	4	Own	SF	H	5.67–6.67	Own	O4IHV	340	483	CN	TX	60	8 ⅛x3x ¼	T
44	.....AC-450	1 ½–5	***	133	193	.....	4835	6.50/20D	34x7	Own 248	6–3 ⅛x3 ⅛	248	6.2	196	88–3000	4–2 ⅛x4 ⅛	Y	Own	4	Own	SF	H	5.71–7.40	Own	L41HV	342	534	CN	TX	60	8 ⅛x3x ¼	T
45	.....AC-500	2–5 ½	***	136	196	.....	5870	7.00/20D	9.00/20	Own 278	6–3 ⅝x4 ½	278	6.0	220	100–2800	7–2 ¾x10 ¾	Y	Own	5	Own	SF	H	5.71–7.40	Own	L41HV	342	534	CN	TX	60	8 ½x3 ⅛x ⅜	T
46	.....AC-550	2–5 ½	***	136	196	.....	5970	7.00/20D	9.75/20	Own 278	6–3 ⅝x4 ½	278	6.0	220	100–2800	7–2 ¾x10 ¾	Y	Own	5	Own	SF	H	5.63–7.20	Own	L41HV	389	663	CN	TX	60	8 ½x3 ½x ⅜	T
47	.....AC-600	2 ½–6	***	136	196	.....	6660	7.50/20D	9.75/20	Own 308	6–3 ¾x4 ½	308	6.1	244	107–2600	7–2 ¾x10 ¾	Y	Own	5	Own	SF	H	5.63–7.16	Own	L41HV	389	663	N	TX	60	8 ¼x3 ½x ¼	T
48	.....AC-650	2 ½–6 ½	***	136	196	.....	7130	8.25/20D	10.50/20	Own 308	6–3 ¾x4 ½	308	6.1	244	107–2600	7–2 ¾x10 ¾	Y	Own	5	Own	SF	R	5.63–7.16	Own	L41HV	480	769	N	TX	60	8 ¼x3 ½x ¼	T
49	.....AC-700	3 ½–7	***	136	196	.....	7860	8.25/20D	10.50/20	Own 361	6–4 ¼x4 ½	361	6.0	284	118–2500	7–3x11 ⅞	Y	Own	5	Own	SF	R	5.63–7.16	Own	L41HV	528	849	N	TX	60	9 ⅛x3 ½x ⅜	T
50	.....AC-800	4–8	***	136	196	.....	9240	9.00/20D	11.25/20	Own 264	6–4 ¼x5	426	6.0	340	141–2400	7–3x11 ⅞	Y	Own	5	Own	2F	R	7.38–9.41	Own	TW41A	617	923	N	TX	60	9 ⅛x3 ½x ⅜	TL
51	.....AC-850	5–10	***	136	196	.....	9795	9.00/20D	11.25/24	Own 451	6–4 ⅝x5	451	6.0	360	145–2400	7–3x11 ⅞	Y	Own	5	Own	2F	R	7.34–9.19	Own	TW4IA	617	923	N	TX	60	9 ⅛x3 ½x ⅜	TL
52	..(c.o.e.) Sp. Del	1	***	112	.....	.....	2820	7.00/16S	7.50/18S	Own 230	6–3 ⅛x4 ¼	230	6.2	.....	.....	4–2 ¼rx5 ⅛	N	Own	3	Own	SF	H	4.57–5.14	Own	O4IH	200	297	eC	2I	.....	6 ⅛x2 ¾x ⅜	T
53	..(c.o.e.) AF-300	1 ½–4	***	108	157	.....	3910	6.00/20†S	7.50/20	Own 228	6–3 ⅛x3 ⅛	228	6.2	180	80–3000	4–2 ⅛x4 ⅛	N	Own	4	Own	SF	H	5.67–6.20	Own	O4IH	337	478	C	2I	64	7x2 ⅝x ½	T
54	..(c.o.e.) AF-350	1 ½–4 ½	***	108	193	.....	4510	6.00/20†S	8.25/20	Own 228	6–3 ⅛x3 ⅛	228	6.2	180	80–3000	4–2 ⅛x4 ⅛	N	Own	4	Own	SF	H	5.67–6.67	Own	LO4IH	349	478	C	2I	64	8x2 ½x ½	T
55	..(c.o.e.) AF-400	1 ½–5	***	108	193	.....	4670	6.00/20D	34x7	Own 248	6–3 ⅛x3 ⅛	248	6.2	196	88–3000	4–2 ⅛x4 ⅛	Y	Own	4	Own	SF	H	5.67–6.67	Own	LO41HV	352	483	CN	TX	64	8 ⅛x3x ¼	T
56	..(c.o.e.) AF-450	1 ½–5	***	108	193	.....	5045	6.50/20D	34x7	Own 248	6–3 ⅛x3 ⅛	248	6.2	196	88–3000	4–2 ⅛x4 ⅛	Y	Own	4	Own	SF	H	5.71–7.40	Own	L41HV	342	534	CN	TX	64	8 ⅛x3x ¼	T
57	..(c.o.e.) AF-500	2–5 ½	***	108	196	.....	6075	7.00/20D	9.00/20	Own 278	6–5 ⅛x4 ½	278	6.0	220	100–2800	7–2 ¾x10 ¾	Y	Own	5	Own	SF	H	5.71–7.40	Own	L41HV	345	584	N	TX	64	8 ½x3 ½x ⅜	T
58	..(c.o.e.) AF-550	2–6	***	108	196	.....	6175	7.50/20D	9.75/20	Own 278	6–5 ⅝x4 ½	278	6.0	220	109–2800	7–2 ¾x10 ¾	Y	Own	5	Own	SF	H	5.63–7.20	Own	L41HV	389	663	N	TX	64	8 ½x3 ½x ⅜	T
59	..(c.o.e.) AF-600	2 ½–6 ½	***	108	196	.....	6645	7.50/20D	9.75/20	Own 308	6–3 ¾x4 ½	308	6.1	244	107–2600	7–2 ¾x10 ¾	Y	Own	5	Own	SF	H	5.63–7.16	Own	L41HV	437	743	N	TX	64	8 ¼x3 ½x ¼	T
60	..(c.o.e.) AF-650	2 ½–7	***	108	196	.....	7125	8.25/20D	10.50/20	Own 308	6–3 ¾x4 ½	308	6.1	244	107–2600	7–2 ¾x10 ¾	Y	Own	5	Own	SF	R	5.63–7.16	Own	L41HV	528	849	N	TX	64	8 ¼x3 ½x ¼	T
61	..(c.o.e.) AF-700	3 ½–8	***	108	196	.....	7965	8.25/20D	10.50/20	Own 361	6–4 ¼x4 ½	361	6.0	284	118–2500	7–3x11 ⅞	Y	Own	5	Own	SF	R	5.63–7.16	Own	L41HV	511	869	N	TX	64	9 ⅛x3 ½x ⅜	T
62	..(c.o.e.) AF-800	4–10	***	108	196	.....	9395	9.00/20D	11.25/20	Own 426	6–4 ¼x5	426	6.0	340	141–2400	7–3x11 ⅞	Y	Own	5	Own	2F	R	7.38–9.41	Own	TW41A	617	923	N	TX	64	9 ⅛x3 ½x ⅜	TL
63	..(c.o.e.) AF-850	5–12	***	108	196	.....	9805	9.00/20D	11.25/24	Own 451	6–4 ⅝x5	451	6.0	360	145–2400	7–3x11 ⅞	Y	Own	5	Own	2F	R	7.34–9.19	Own	TW4IA	617	923	N	TX	64	9 ⅛x3 ½x ⅜	TL
64	...(D) ADC-440	1 ½–4 ½	***	136	196	.....	6270	6.00/20D	34x7	Own 3-7⅛S	3–4 ¼x5	213	16	230	65–2000	4–3 ½x4 ⅜	Y	Own	4	Own	SF	H	4.86–5.83	Own	L41HV	342	534	CN	TX	60	8 ½x3 ½x ⅜	T
65	coe (D) ADF-440	1 ½–5	***	108	196	.....	6355	6.00/20D	34x7	Own 3-7⅛S	3–4 ¼x5	213	16	230	65–2000	4–3 ½x4 ⅜	Y	Own	4	Own	SF	H	4.86–5.83	Own	L41HV	342	534	CN	TX	64	8 ½x3 ½x ⅜	T
66	...(D) ADC-500	2–5	***	136	196	.....	6715	7.00/20D	9.00/20	Own 3-7⅛S	3–4 ¼x5	213	16	230	65–2000	4–3 ½x4 ⅜	Y	Own	5	Own	SF	H	5.71–6.29	Own	L41HV	342	534	CN	TX	60	8 ½x3 ½x ⅜	T
67	coe (D) ADF-500	2–5 ½	***	108	196	.....	6925	7.00/20D	9.00/20	Own 3-7⅛S	3–4 ¼x5	213	16	230	65–2000	4–3 ½x4 ⅜	Y	Own	5	Own	SF	H	5.71–6.29	Own	L41HV	345	584	N	TX	64	8 ½x3 ½x ⅜	T
68	...(D) ADC-600	2 ½–6	***	136	196	.....	7570	7.50/20D	9.75/20	Own 3-7⅛	3–4 ¼x5	213	16	263	83–2000	4–3 ½x4 ⅜	Y	Own	5	Own	SF	H	5.63–7.16	Own	L41HV	389	663	N	TX	60	8 ¼x3 ½x ¼	T
69	coe (D) ADF-600	2 ½–6 ½	***	108	196	.....	7560	7.50/20D	9.75/20	Own 3-7⅛	3–4 ¼x5	213	16	263	83–2000	4–3 ½x4 ⅜	Y	Own	5	Own	SF	H	5.63–7.16	Own	L41HV	437	743	N	TX	64	8 ¼x3 ½x ¼	T
70	...(D) ADC-700	3 ½–7	***	136	196	.....	8850	8.25/20D	10.50/20	Own 4-7⅛S	4–4 ¼x5	284	16	308	86–2000	5–3 ½x5 ½	Y	Own	5	Own	SF	R	5.63–6.43	Own	L41HV	528	849	N	TX	60	9 ⅛x3 ½x ⅜	T
71	coe (D) ADF-700	3 ½–8	***	108	196	.....	8960	8.25/20D	10.50/20	Own 4-7⅛S	4–4 ¼x5	284	16	308	86–2000	5–3 ½x5 ½	Y	Own	5	Own	SF	R	5.63–6.43	Own	L41HV	511	869	N	TX	64	9 ⅛x3 ½x ⅜	T
72	...(D) ADC-800	4–8	***	136	196	.....	10065	9.00/20D	11.25/20	Own 4-7⅛	4–4 ¼x5	284	16	350	110–2000	5–3 ½x5 ½	Y	Own	5	Own	2F	R	7.38–8.64	Own	TW41A	617	923	N	TX	60	9 ⅛x3 ½x ⅜	T
73	coe (D) ADF-800	4–10	***	108	196	.....	10235	9.00/20D	11.25/20	Own 4-7⅛	4–4 ¼x5	284	16	350	110–2000	5–3 ½x5 ½	Y	Own	5	Own	2F	R	7.38–8.64	Own	TW41A	617	923	N	TX	64	9 ⅛x3 ½x ⅜	T
74	...(D) ADC-850	5–10	***	136	196	.....	10620	9.00/20D	11.25/24	Own 4-7⅛	4–4 ¼x5	284	16	350	110–2000	5–3 ½x5 ½	Y	Own	5	Own	2F	R	7.34–9.19	Own	TW4IA	617	923	N	TX	60	9 ⅛x3 ½x ⅜	T
75	coe (D) ADF-850	5–12	***	108	196	.....	10650	9.00/20D	11.25 24	Own 4-7⅛	4–4 ¼x5	284	16	350	110–2000	5–3 ½x5 ½	Y	Own	5	Own	2F	R	7.34–9.19	Own	TW4IA	617	923	N	TX	64	9 ⅛x3 ½x ⅜	T
76	Walter.....AXBS	5–8	10500	138	162	31000	12000	10.50/24D	10.50/24	Her HXE	6–4 ⅜x5 ¼	935	5.3	610	200–2000	7–3 ½x16 ⅝	Y	Own FA	6	Own FCC	2D	H	7.5 –9.1	Own FC	O4IA	560	890	D	FI	108	14x3 ¾x ½	TB
77	.....(D) ADKD	5–7	10000	126	138	28000	10500	9.75/24D	10.50/24	Her DRXB	6–5 ¼x6	474	...	350	125–2000	7–3x13 ¾	Y	Own FA	6	Own FCC	2D	H	7.5 –9.1	Own FC	O4IA	560	890	D	FI	96	14x3 ¾x ½	TB
78	.....(D) ADBS	5–8	11000	138	162	31000	12000	10.50/24D	10.50/24	Cum HB6	6–4 ⅞x6	672	...	500	150–1800	7–4 ½x16	Y	Own FA	6	Own FCC	2D	H	7.5 –9.1	Own FC	O4IA	560	890	D	FI	108	14x3 ¾x ½	TB
79	.....(D) ADVD	15	12500	126	162	50000	15000	13.50/24D	13.50/24	Cum HB6	6–4 ⅞x6	672	...	500	150–1800	7–4 ½x16	Y	Own FA	6	Own AV	2D	H	**–10.5	Own AV	O4IA	620	1020	D	FI	96	14x3 ¾x ½	TB

† Rear 32 x 6. †† Rear 7.50/16

HUG

BOTTOM DUMPERS



THE Hug Co., Highland, Ill., has announced an addition to its line of Roadbuilder designed equipment. The additions represent three series of bottom dump roadbuilders consisting of a truck tractor chassis and a bottom dump semi-trailer unit. The new models have been designated as 700, 850 and 100 and range in capacities from 7 to 15 yd.

The 700 Series is represented by the Model 701 which is offered with a 7 to 8½-yd. bottom dump semi-trailer. Series 850 is represented by the Model 851 furnished with 8½ to 10-yd. semi-trailer and Series 100 is represented by the Model 101 and the 12 to 15-yd. semi-trailer.

The Model 101 is equipped with Waukesha 6RB engine, 5 x 5¾, an 8-speed unit transmission direct and overdrive providing a total combination of 8 speeds forward and 2 reverse. A Timken-Wisconsin double-reduction full-floating rear axle, all welded I-Beam frame, 9.75/20 single front and 18.00/24 single rear tires. Westinghouse air brakes on all four wheels with independent control for semi-trailer. All models are equipped with the Hug Front Axle Rocker.

The bottom dump semi-trailer unit is a specially designed unit to work with the Hug tractor and is of all-welded construction heavy-duty type and built with a minimum of weight and maximum payload capacity. The bottom dump drop gates are operated from the driver's seat.

WALTER

ADDS MODELS "ADVD" AND "AXBS"

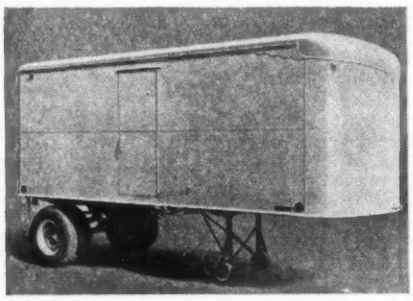
THE Walter Motor Truck Co. is offering a new 150 hp. 15-ton diesel chassis, model ADVD, for use with 10-yd. dump bodies or to haul 50-ton semi-trailers.

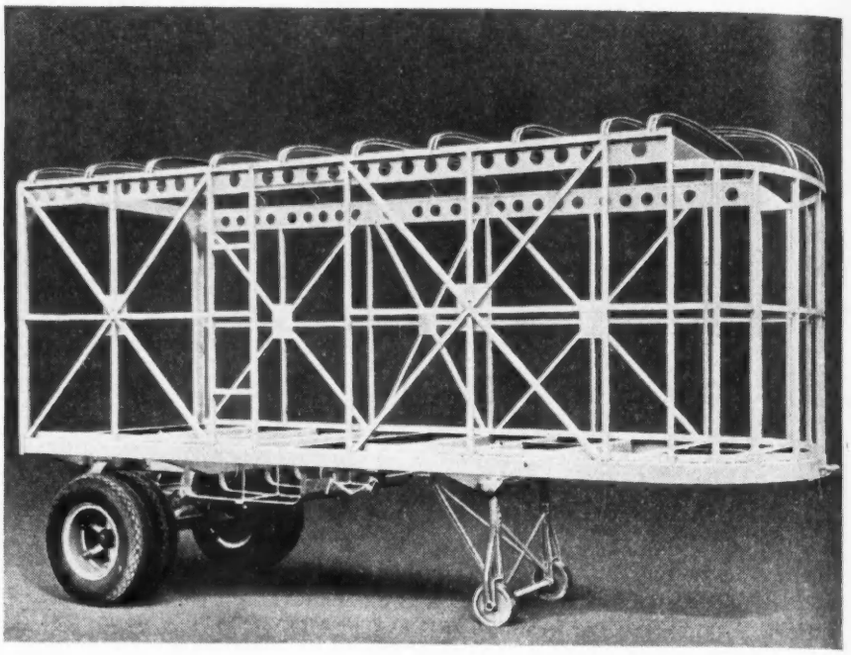
This series has been built for very heavy work. The rear axle has a nominal capacity of 50,000 lb. and is provided with springs that are 6 in. wide with ⅝ in. thick leaves. These axles have been designed to permit the use of 15:00/24 tires, dual rear, with total gross weights on four wheels up to 70,000 lb. The six-speed forward and two reverse transmission, single lever control, provides a high gear speed of 25 m.p.h. and a low gear reduction of approximately 150 to 1, with proper spacing of all intermediate ratios. The diesel engine is a Cummins, model 6HB. The cab is mounted forward over the front axle, resulting in very short wheelbase and proper load distribution.

Walter Snow Fighter, AXBS, 5-8 ton, is provided with a six-cylinder engine, 5¾-in. bore, 6-in. stroke, developing 200 hp. at 2000 r.p.m. These powerful Snow Fighters are generally equipped with a large sedan cab, with an independent seat for the driver, an independent seat for the plow operator and a rear seat of sufficient width to seat four men comfortably.

This chassis embodies the four point positive drive system, the suspended double reduction drive and six-speed forward transmission, resulting in maximum pushing power for all snow conditions.

Complete specifications of new models are published on opposite page.





TRAILERS

FRAMELESS CONSTRUCTION FEATURED

SHOWN above are two views of a new, lightweight, alloy, frameless trailer designed and built by Fruehauf Trailer Co. High-tensile steel construction converts unproductive weight into additional payload capacity. The light, tubular steel construction of the body, similar to modern airplane structure, serves to "tie in" the body with chassis as a complete unit. Vertical posts with diagonal trusses, a feature of this construction, add greatly to the strength of the trailer.

Because the body framework has been designed to carry its rated load without stressing the side panels, aluminum paneling is used for sides and front, a further means of weight-cutting. These side panels can be readily removed and replaced without disturbing the skeleton structure. Most connections in both base frame and body are nested and welded.

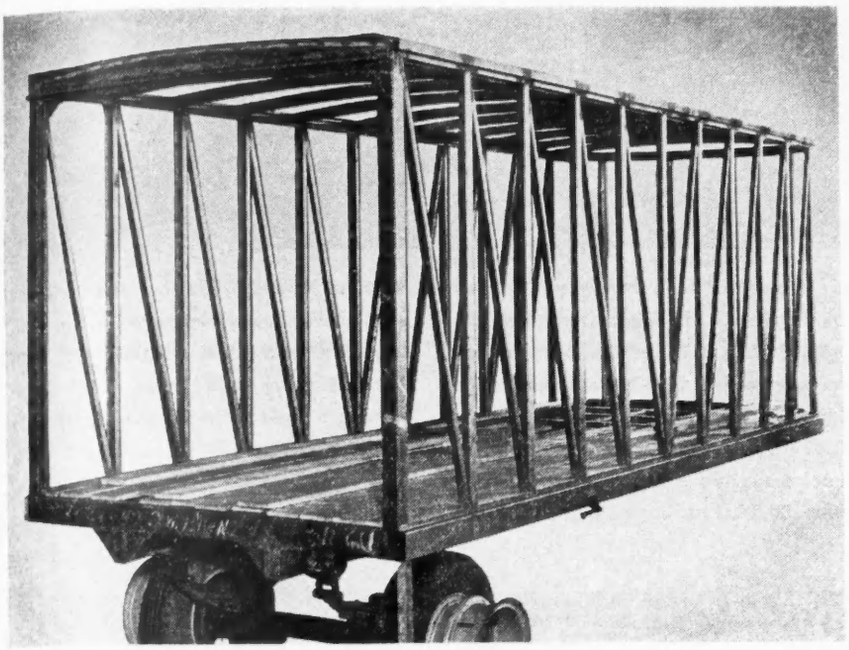
Other features of the new alloy frameless trailer include an all-metal, rust-resistant roof which reflects the sun's rays; steel-covered rear doors and tailgate; corrugated metal slats which run horizontally around the interior walls of the trailer to protect panels, and progressive-type springs.

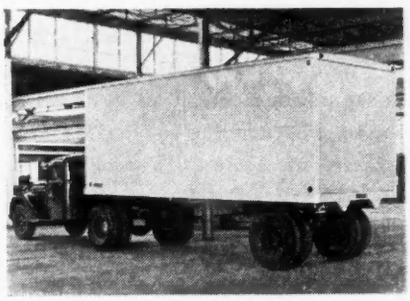
Although slightly higher in cost than the ordinary freight-hauling trailer, this new alloy-frameless unit has greater payload capacity, gives assurance of longer life, and can be serviced more easily.

Below, left: A tandem-axle General Motors trailer fitted with pullman roof and used for heavy paper stock loads. It is pulled by a GMC F-46B tractor. Below, right: The "Thriftmaster" is one of three standardized body types offered by Highway Trailer Co. Others are the "Freightmaster" and "Roadmaster"

SECTION 2

TRAILERS



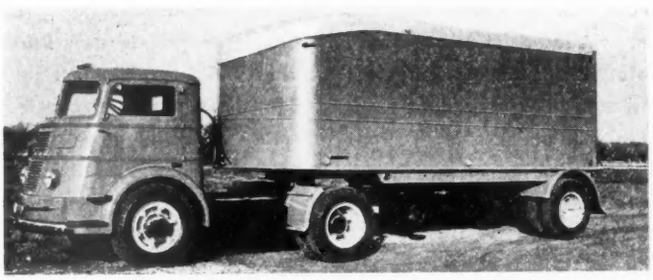


THE two illustrations above show a Trailmobile designed by the Trailer Co. of America which can carry 40 times its own weight in payload and has been overloaded as much as 25 per cent of its rated capacity, carrying loads as great as 14 tons without revealing the slightest, permanent distortion of frame or body members.

Following extensive experiment with this design, several units were placed in service. These are semi-insulated bodies of bridge truss construction on frameless chassis. The entire frame and panels, including posts, header, ribs, floor members and all metal parts are of alloy steel with square tubular struts and posts, all metal roof with lengthwise roof corrugations for greater strength.

The sides are insulated with Reynolds Master Metal, with Naturzone in stiles and rails of doors and 2½-in. Dry Zero blanket in the roof.

T-type shackles, spring suspension and Timken tubular axle, with 9.75/20 tires sustains the load. When it is considered that this unit is mounted with 9.75/20 tires, 16½ in. x 5 in. mountain type brakes and the body is fully lined including welded metal floor pan, the low weight and the high ratio of payload to dead weight is remarkable. With gross and axle load limitations imposed or considered in virtually every state, weight reduction is obviously of vital importance.



IN THE NEW SEMI-TRAILER DESIGNS

Below, left: A new Edwards trailer model A-41 with insulated Edwards body, type VD. Below, right: The Mack model ST-30 semi-trailer features co-incidental safety lock which engages brake when the support wheels are lowered. Above: Insulated Gramm trailer specially designed to keep heat in, cold out

Two trucks like this, with their all-aluminum bodies were built by Brown Industries for the Sperry Flour Co. for city and country hauling. Use of lighter aluminum effected an increase in the payload carried of 2000 lb. We regret we cannot give you the color scheme of these good-looking jobs

This frameless milk tank by Pfaudler Co., Elyria, O., is fabricated of U.S.S. 18-8S, Stainless Type 304. Cork insulation is covered with auto sheet under which is a sheet of U.S.S. Cor-Ten, to which rear wheel assembly and fifth wheel mounting are connected. Dimensions: 50x80x194 in. inside. 2650 gal.

Vertical panel Met-L-Wood ribless semi-trailer body, insulated with 4-in. Dry Zero and lined with No. 2x3/8 in. panels. Inner and outer shell independent. Inside dimensions: 23 ft. 2¾ in. long, 6 ft. 11¾ in. wide and 6 ft. 6 in. high. Spacer panels at rear. By Leonhardt Wagon Mfg. Co., Baltimore

Electrically refrigerated, this body was built by Meyer Body Co., Buffalo, N. Y. It has three doors on the curb side, one in the rear and one on the street side. The capacity is 700 gal. of ice cream. Color scheme: DuPont Dulux 93-066 red and duPont Dulux 81-963 white

Materials used in this meat packer's body by Lufe Mfg. Co., Lansing, Mich., are: sheet steel or Plymetl panels; Motor Products snap-on steel moldings; Hansen 70-D rear door lock; York fenders. Color scheme: DuPont Dulux orange; black striping; Perma lux transfers; aluminum roof enamel

This striking lumber body is a traveling billboard. Framing and floor of oak, side panels and skirting are of steel. Truck Engineering Corp., of Cleveland, used its own roller equipment in building this body. Color scheme: Sherwin Williams orange above a cream belt line, and black below

BODIES
Body Materials

Metropolitan Body Co., Bridgeport, Conn., is now building its Metro double capacity body for ¾, 1 and 1½-ton chassis, in addition to the ½-ton job. The one pictured is an 11-ft. job on a 1-ton chassis. It has a payload width of 68 in. and a height of 62 in. Wheelbase is 122 in. Similar Metro units are being displayed by leading chassis builders

AND BODY EQUIPMENT . . . . . WITH

SECTION 3

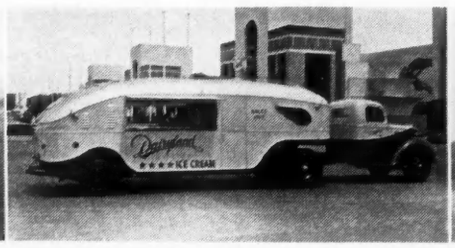
BODIES

BODY MATERIALS & BODY EQUIPMENT

By using new Alan Wood high strength Dyn-El steel and redesigning to take advantage of its additional strength, this body was built with a weight saving of 1765 lb. Scale weight of finished body is 2665 lb. Dimensions: 16 ft. 4 in. long, 6 ft. 11 in. wide, 6 ft. high. By H. H. Kaiser, Philadelphia

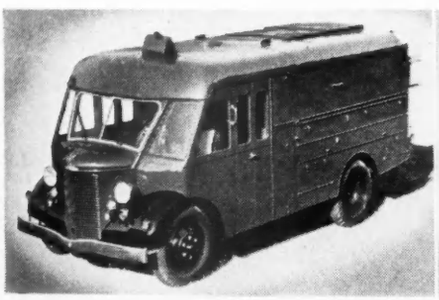
Paneled inside and out with galvaneal over plywood and insulated with Dry Zero in side walls and roof and Armstrong cork in floor, this body was built by Fitz Gibbon & Crisp Co., of Trenton, N. J. Moldings are of aluminum. Color scheme in Pittsburgh Plate Glass Cream and Vermillion Lavax

The Gerstenslager Co., of Wooster, Ohio, built this body, which serves as an emergency airship mooring mast. Entire exterior, including top, is of steel. Safety glass is used throughout. Rear doors are equipped with Hansen hardware. Color scheme: Goodyear airship colors—silver and blue

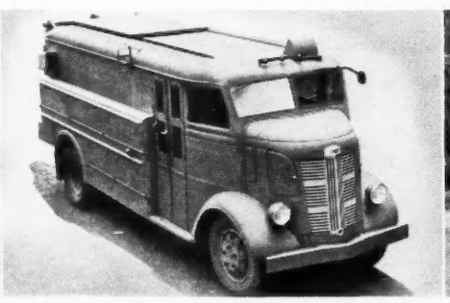


A retail stand that goes where the crowds gather, this sales promoting monocoque trailer body was built by American Body & Equipment Co., Dallas, Tex. It is 24 ft. long and 94 in. wide. The sidewall lifts up to form an awning. Neon signs supplement the handsome red and white color scheme

Business is speeded up with this Gar Wood hoist and body unit mounted on a heavy-duty truck. The 16-yd. steel body is a two-way, side dump equipped with automatic, down-folding tailgate and Gar Wood dual hydraulic hoists. This unit is used in Illinois stripping work. Loads are dumped into cars



This new all-steel public utility line body is of the unitary design offered by Baker-Raulang Co., Cleveland. Crew cab and body are separate and joined by a flexible concealed connection. Distortion and body wrack resulting from operation of derricks and use over rough roads and uneven ground is said to be eliminated. The cab accommodates up to nine men



The 4406 integral cab and body line construction unit designed by American Coach & Body Co., Cleveland, effects a saving of 18 in. of valuable platform length. The unit illustrated is mounted on a standard 160-in. wheelbase cab-over-engine chassis. On the right side is bus-type folding door. The emergency door on the left side is hinged type with drop glass

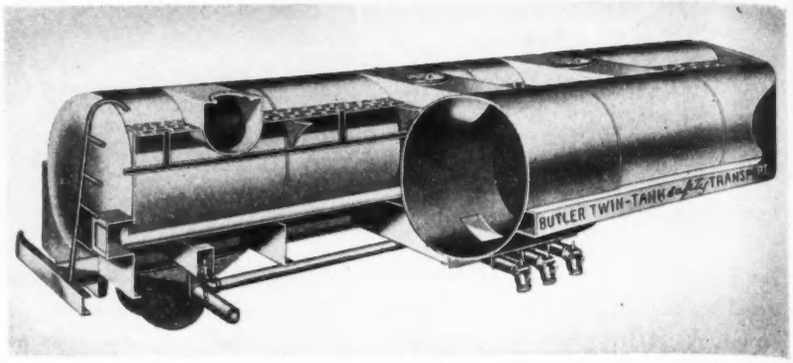
All steel, parcel delivery C.O.E. design, model 4000, of York-Hoover Body Corp., York, Pa. Interior of roof, sides and under surface of floor are insulated, in addition to three-ply plywood lining at sides, roof and rear doors. Safety glass throughout. Color schemes are optional. Body hardware, consisting of locks and sliding door roller, by Hansen. Capacity: 261 cu. ft.

MORE EXAMPLES ON FOLLOWING PAGE

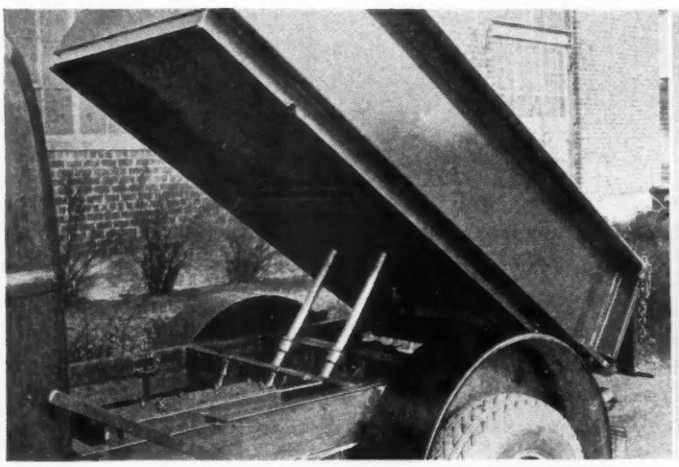
BODIES

BODY MATERIALS & BODY EQUIPMENT

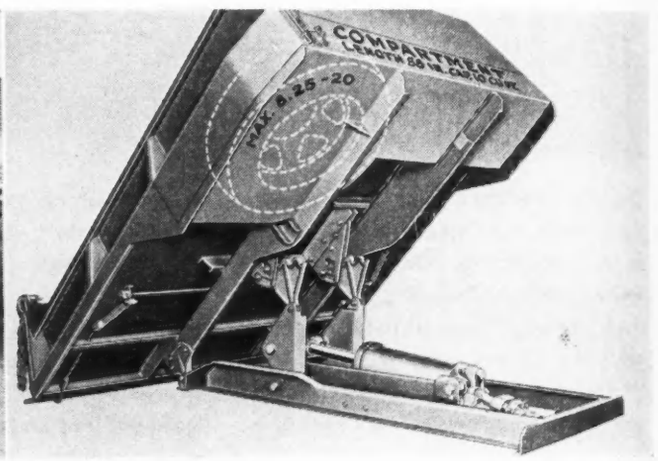
(Continued from page 51)



Here you see an unusual development of the Butler Mfg. Co., Kansas City, Mo. For regular gasoline haulage, the Twin-Tanks are shaped cylindrical over the fifth wheel, abround back of the fifth wheel and tied integrally in upright position. This makes possible nearly ½ gallon more capacity per inch of tank length as compared to the conventional flat oval tank. It also increases strength. Joint manholes and fill opening centered between the Twin-Tanks eliminates spillage, damage to finish and fire hazard



The Hercules Tonner steel dump body with hand hydraulic hoist has a mounting height of 10 in. and dumping angle of 45 deg. making it a practical unit for many vocations



The Hercules tire pack dump body has a compartment to carry an 8.25/20 spare tire and an 18 x 9 in. full body width box to carry tools, flares, flags, shovels, etc.

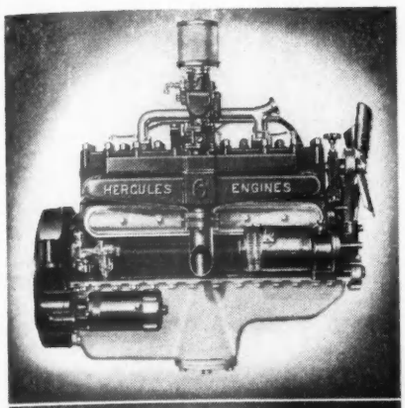
St. Paul Hi-dumper hoist on type 673 scoop-end rock body of 6-yd. capacity. Body constructed of ¼-in. material with I-beam braces. Hoist has a dumping angle of 72 deg.

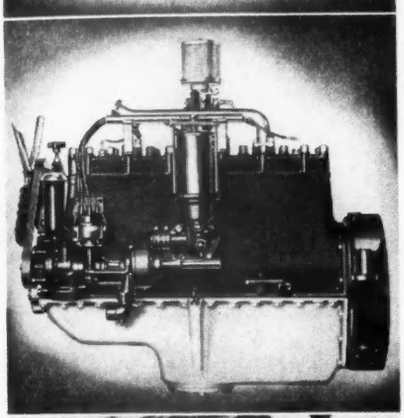
Showing installation of new universal door and end gate lock—the Clamptite—made by Eberhard Mfg., Cleveland. Can be applied without change and without special parts

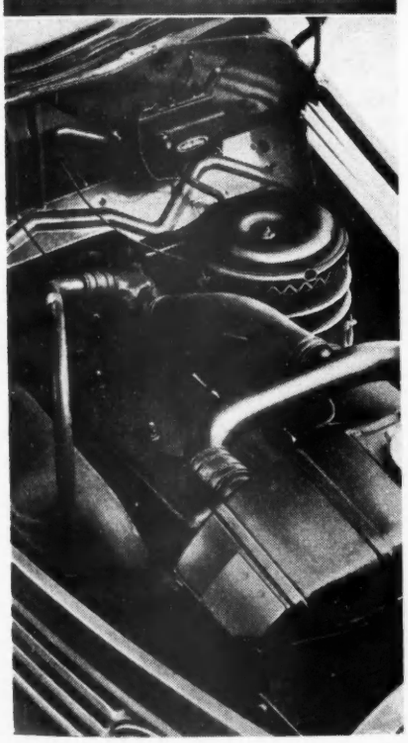
SECTION 4

ENGINES

Below: The Hercules diesel package for Ford trucks is designed to fit perfectly without alterations. Flywheel housing and front gear cover are identical with Ford units. Further down are two views of the new RXL gasoline engines offered in 529 and 558-cu. in. sizes







A COMPLETE diesel package including the DOOC engine for converting Ford trucks to diesel power is a feature of the Hercules Motors Corp. line for 1939 as well as two new gasoline engines.

The diesel package contains everything required in making the change from gasoline to diesel engine in Ford trucks from 1935 to 1939. The DOOC is a four-cylinder engine with 4-in. bore and 4½-in stroke. The mounting dimensions are identical with those of the Ford engine. The engine has 226 cu. in. piston displacement, giving 70 hp. at 2600 r.p.m. and 162 lb. ft. of torque at 1400 r.p.m. The compression ratio is 16 to 1.

In the package this engine is fitted with a special flywheel housing to fit the Ford transmission and a special front gear cover with supporting arms which duplicate the front engine mounting. A complete replacement wiring harness and directions for installation are furnished. It is said to require little more effort than replacing with a standard engine. No special tools are required and the work can be done by one mechanic and a helper in any shop equipped with a chain hoist.

The new gasoline engines are the RXLC and the RXLD. They have cubic inch displacements of 529 and 558, respectively. The bore of the first is 4⅜ in. and the stroke is 5¼ in. The other has a bore of 4¾ in.

(TURN TO PAGE 94, PLEASE)

HERCULES

MOTORS

Offers a complete diesel replacement package for Ford V-8 trucks, models 1935-1939 inclusive, and announces two new gasoline engines in RXL series

MACK'S THERMODYNE

New high-output engine, in three sizes, departs from previous practice with overhead valves and features controlled combustion with improved chamber design

MACK-INTERNATIONAL Motor Truck Corp. has produced a new gasoline engine in which high output has been combined with heavy duty design.

Mack engineers have developed a combustion system which affords high power and torque per cubic inch; high sustained output over a wide range of speed; agile responsiveness and tenacity of pulling power without detonating tendencies on ordinary gasoline.

These results are obtained by combustion control, whereby high mean effective pressure with smooth, even pressure rise and rate of burning are secured through high turbulence and correct spark plug location, free-flow valves, and porting, and improved manifold distribution.

Such established features, as case-hardened crankshaft, full counterweighting, case-hardened and ground, forged timing gears, directed water flow, rifle-drilled oil passages, independent bell housing, Permafit valve seat inserts, shock insulated support, and cold-circulation thermostatic temperature control are incorporated in their most highly developed form in the Thermodyne engine.

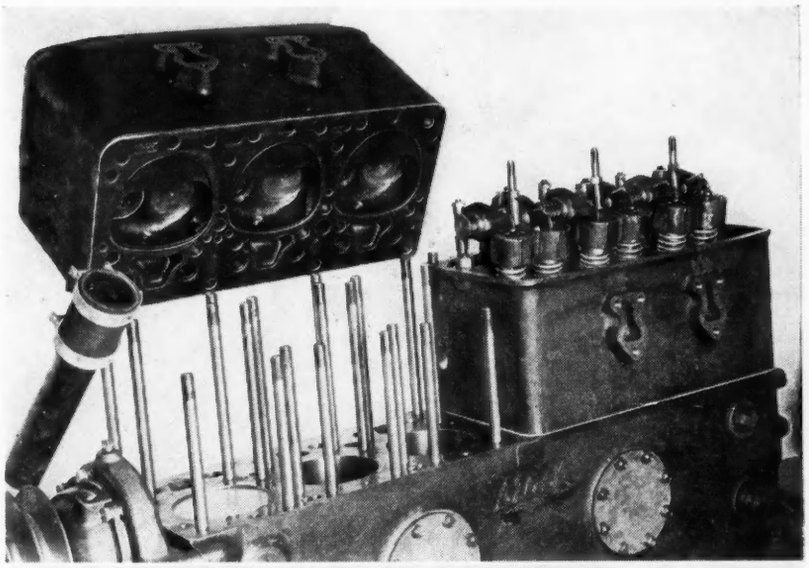
The Thermodyne engine departs from previous Mack practice of L-head design and resorts to overhead valves. Larger and freer porting for the valves has been achieved, as well as more direct flow. Greater water space has been afforded about their seats.

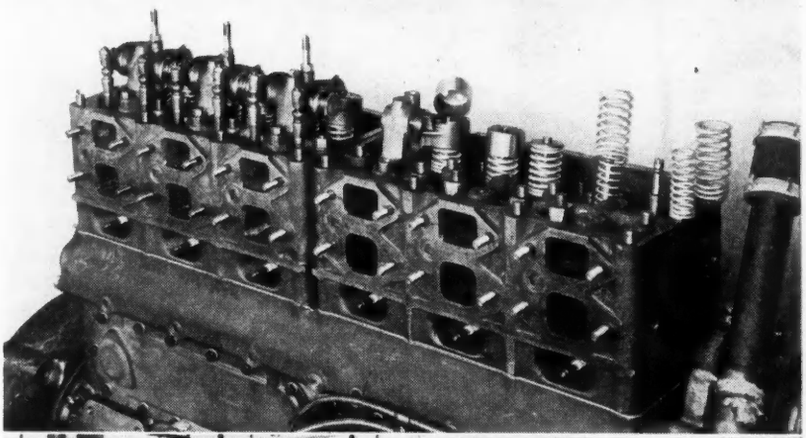
The combustion chamber is formed in the shape of a letter D, rising to a half dome and offset so as to cover one side of the bore. The other side

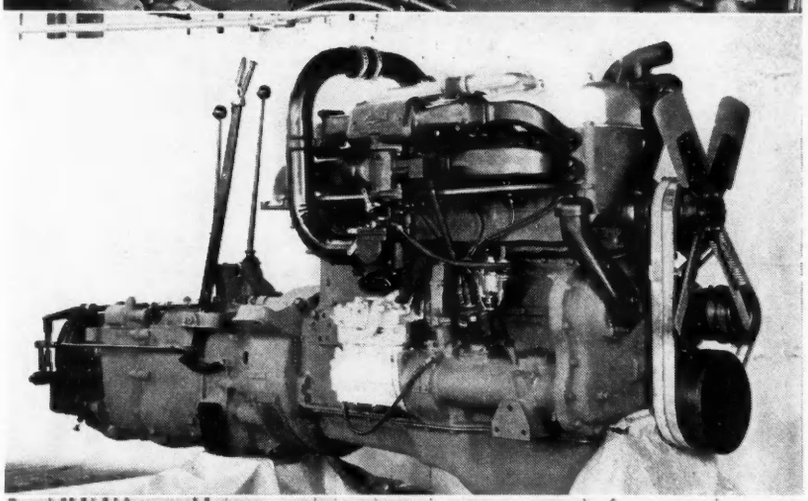
Specifications of the Mack Thermodyne Engine

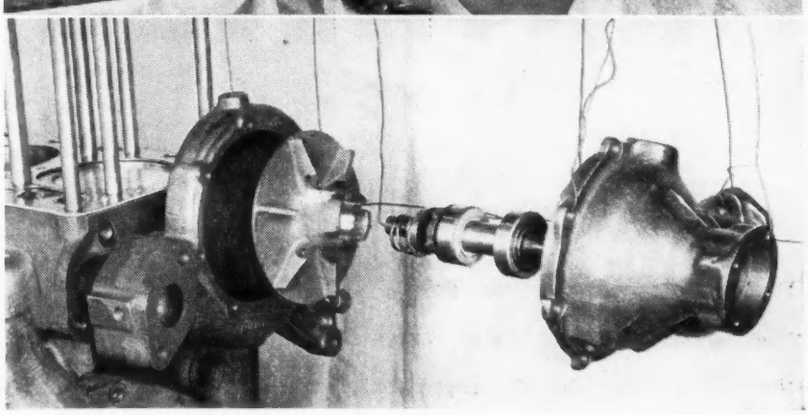
MODELS	EO	EP	EY
Number of cylinders	Six	Six	Six
Bore and Stroke	4⅜ x 5¾	4¾ x 5¾	5 x 6
Piston Displacement, cu. in.	518	611	706
Compression ratio (Standard)	5.0	5.0	5.0
(Special)	5.3 — 5.7	5.3 — 5.7	5.3 — 5.7
Compression pressure in lbs.	105 @ 1000	106 @ 800	106 @ 1000
Brake Horsepower, maximum	140 @ 2300	152 @ 2200	170 @ 2100
at governed speed	132 @ 2000	145 @ 2000	166 @ 1900
Maximum torque, pound-feet	365 @ 1000	426 @ 900	500 @ 800
Mean effective pressure, maximum	106	106	106
Cylinder heads cast	In threes	In threes	In threes
Piston rings, number and width, Compression	Three, 1/8	Three, 1/8	Three, 1/8
Oil control	Two, 3/16	Two, 3/16	Two, 3/16
Wristpin, diameter	1 7/16	1 7/16	1 7/16
Length	3 15/32	4 5/32	4 13/32
Retention	Aluminum plugs Full floating	Aluminum plugs Full floating	Aluminum plugs Full floating
Main bearings, number and diameter	Seven, 3½ in.	Seven, 3½ in.	Seven, 3½ in.
Total length	11 1/16	11 1/16	11 1/16
Connecting Rod Bearings, diameter	3	3	3
Total length	12 5/16	12 5/16	12 5/16
Intake valves, diameter	2 1/16	2 1/16	2 1/16
Exhaust valves, diameter	1 3/4	1 3/4	1 3/4
Valve lift	½	½	½
Exhaust pipe bore	3 1/16	3 1/16	3 1/16
Carburetor size (single venturi)	1¾	2	2

Opposite page top to bottom: The new Thermodyne engine with one head removed showing valve location and combustion chamber design. With manifolds removed, the twin rows of valve ports above the spark plug recesses are apparent. The completely assembled engine. And details of the water pump assembly









of the bore is covered by the flat underside of the head with very small clearance over the top of the piston when at top center. Thus the combustion chamber is offset, as in L-head practice.

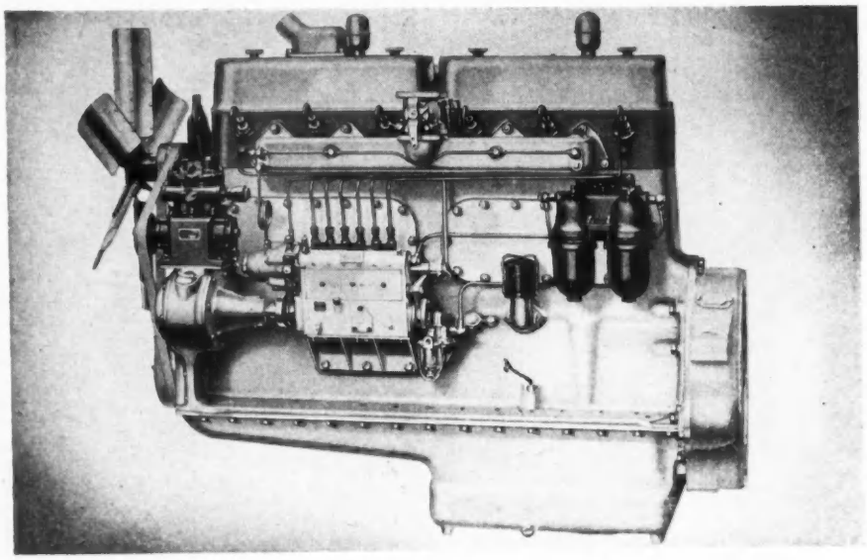
The valves are located at the top of this chamber and slightly inclined toward the cylinder axis. Consequently, gases flow through the valves and into and out of the cylinder by the most direct path, the intake gases rapidly sweeping over the spark plug to cool it and insure an abundance of clean gas next it. As the intake valve is to one side of the combustion chamber, the incoming gas is given a swirling motion, which is accelerated on the compression stroke so that just before firing, the gas compressed into the combustion space is highly turbulent.

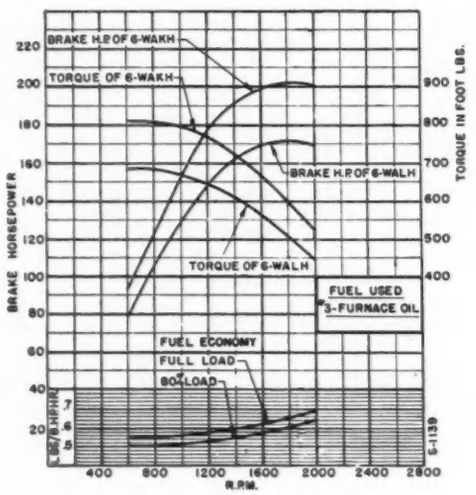
The spark plug is located midway of the curved sidewall, so that the flame front, as it progresses away from the spark, moves through a symmetrical space with rapidly increasing area. This causes an even, thorough combustion with freedom from detonation under the heavy loads with standard grades of gasoline.

The engine has larger bearing surfaces than usual in engines of its displacement, longer connecting rods and a heavier crankshaft, but it is not unduly heavy. Weight has been saved and stiffness gained by casting the cylinders in block with the crankcase. Aluminum pistons aid in saving weight.

Crankshaft and timing gears as well as camshaft and cams are case-hardened. Seven bearings are used for

(Turn to Page 92, Please)





WAUKESHA

Overland 6 is heavy-duty, aluminum, oil-burning engine available in two sizes. Cast iron heads, spark ignition and solid injection of fuel are features

Left: The business side of the new Overland 6 engine. The injector cuts out three cylinders for low idling speeds. Below: Power chart showing horsepower and torque of both sizes

TWO new spark-ignited fuel oil engines are introduced by the Waukesha Motor Co. for 1939. These engines are large, the 6WAKH having 1199 cu. in. of piston displacement and the 6WALH having 1013 cu. in. For automotive service these engines will be built with all-aluminum crankcase, cylinder block, timing gear cover, oil pan and bell housing. Only the head will be cast iron.

The engines are described as low pressure oil engines with solid injection of fuel oil. They can be primed with gasoline and can be started easier than a gasoline engine of comparable size. Special fuels are not required as these engines accommodate a large range of fuels, even handling kerosene or gasoline in emergencies. Pressures are considerably lower than on diesel engines.

The engines idle at low speeds. Injection of three of the six cylinders is cut off at idling speeds. The pumping load of the three cylinders slows down the operation of the three live cylinders without loss of economy. The automatic advance for the fuel pump is built into the timing gears.

Two cylinder heads are required per engine. Crankcase and cylinder frame is one unit. Cylinders are Molychrome wet sleeves. Pistons are cast iron with four piston rings and full floating piston pins. Aluminum pistons are available at extra cost. The crankshaft is supported by seven 4 in. diameter main bearings. Connecting rod journals are 3 in. diameter. All bearings are steel backed babbitt lined precision bearings.

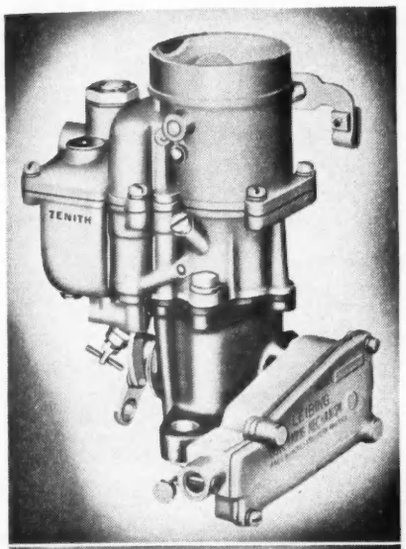
The 6WAKH has a 6¼ in. bore and a 6½ in. stroke. Intake valve diameters on both engines are 2⅜ in. with 2 in. exhaust valves. Lubricating oil capacity of both engines

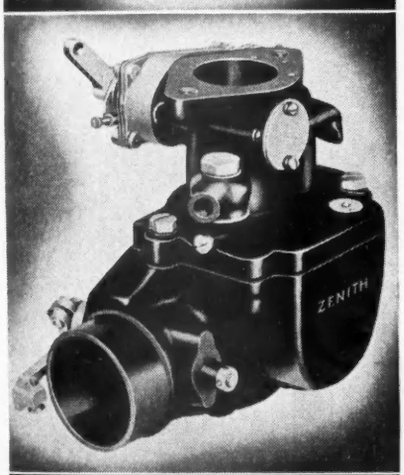
(TURN TO PAGE 94, PLEASE)

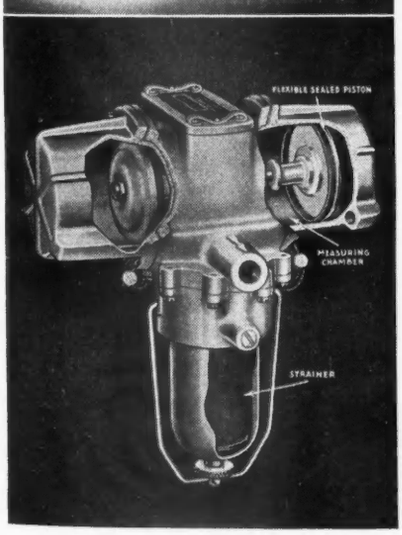
SECTION 5

ENGINE ACCESSORIES

Below: A downdraft and an updraft model typical of the Zenith carburetor line featuring a built-in governor for the first time. Only one throttle valve is used for simplified and improved operation. Bottom: The Bowser Akraflo connects into the gas line, measures fuel consumption by accurate displacement method and records total







Carburetor-Governor

A new line of carburetors, incorporating a built-in governor for the first time, is currently in production at the Zenith factory. Elimination of the second throttle valve is the most important advantage. Not only is operation simplified, but manifold distribution is improved and the mechanism is said to be 100 per cent cheat-proof. Ball bearings on the single throttle valve shaft permit smooth, sharp governing action, and because the governor is mounted in the carburetor's cast iron body, warpage is eliminated. Leibing makes the governor unit.

The new units are now available in 1¼ in. and 1½ in. downdraft assemblies, and in 1¼ in., 1½ in. and 1¾ in. updraft assemblies. Fleetmen interested in this latest development in speed control should get in touch with Zenith Carburetor Division, Bendix Aviation Corp., Detroit, Mich.

Akraflo Meters Fuel

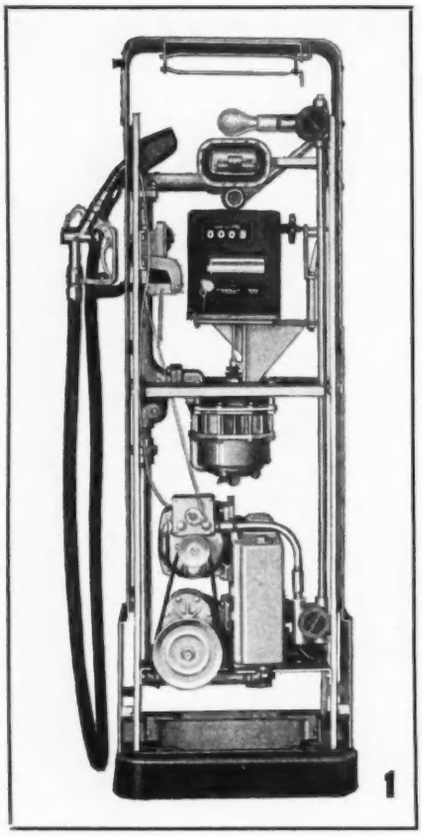
Fleetmen who seek a really accurate method of measuring fuel consumed either for short test runs or over long periods of time, will be interested in the Bowser "Akraflo," just introduced. Designed for permanent installation in the truck's fuel line, the device registers total gallons and tenths of gallons consumed up to 9999 gal. Accuracy is assured by the positive displacement principle incorporating twin measuring chambers, of exact known dimensions.

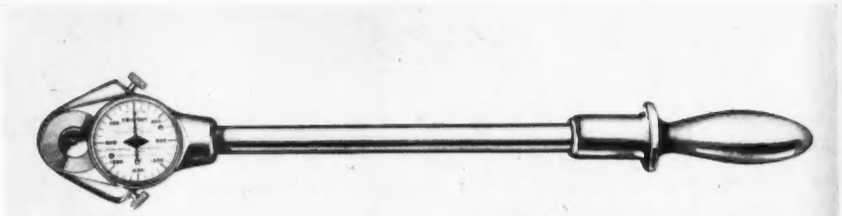
The unit may be secured with either integral or remote indicating dials, the latter being electrically operated. Usual installation is between the pump and carburetor. Ca-

(Turn to Page 110, Please)

ENGINE ACCESSORIES

Zenith offers a combination carburetor and governor . . . Bowser's meter measures and records vehicle fuel consumption . . . other items for economical operation





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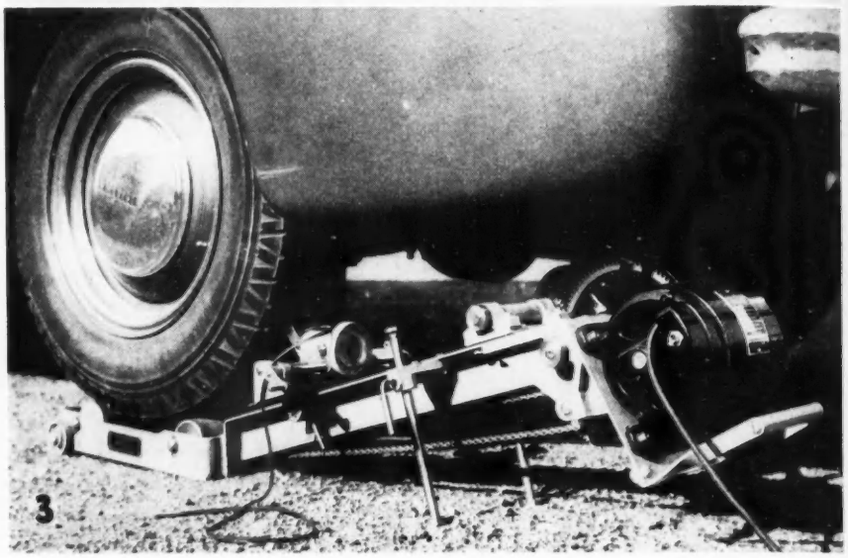


3

SHOP Equipment

Some worthwhile new items developed recently to promote efficient maintenance of vehicles in fleet shops

1. Recording Gas Pump

A printed card showing the exact number of gallons delivered in every transaction is furnished automatically by the new Bowser 510 K Printing Pump. The mechanism is fool and tamper-proof and is locked out until blank receipt is inserted, eliminating any possibility of mistaken records. Here is a really positive check on gasoline delivery. Better get in touch with S. F. Bowser & Co., Inc., Fort Wayne, Ind., for full details.

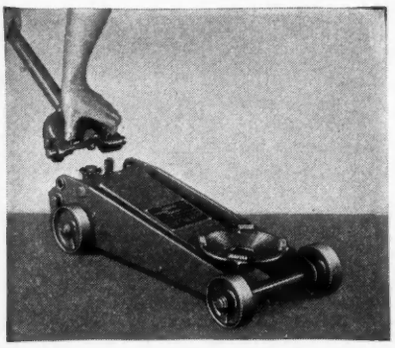
2. Heavy-Duty Torque Wrench

Readers will recall that torque indicating wrenches came in for quite a play in the August issue of COMMERCIAL CAR JOURNAL. At that time all current models of various manufacturers were shown. But since then a new heavy-duty Kwik-Way has been introduced to handle all requirements up to 3500 lb. in., more than ample to meet the most rigid requirements. The large dial gage reads direct in lb. in. More details may be secured from the Cedar Rapids Engineering Co., Cedar Rapids, Iowa.

SECTION 6

SHOP EQUIPMENT

4



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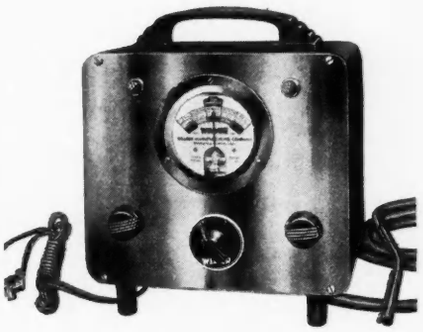


7

3. Motor-Driven Groover

Latest contribution to the tire regrooving art is the motor-driven Roll-About Groover. Machines of similar design but without the motor drive have found wide use in fleet shops throughout the nation where the ease and efficiency of regrooving tires on the truck has been found a valuable factor. It is merely necessary to jack the wheel up, roll the regroover underneath, lower the wheel slightly onto the rollers, set the knife and start the electric motor. Roll-About does the rest. Fleet owners would do well to address Safe Tool Mfg. Co., Bridgeport, Pa., for full details.

4. Large Volume Lubricator

For shops with large lubricating volume, the new large-capacity heavy duty Aro lubricator holds all the answers. Built to surround a 400-lb. drum, the unit will deliver any lubricant normally used direct from the drum in large volume. The pumping unit is double-acting delivering power on both up and down strokes. A twin post air-operated lift facilitates drum change. Complete specifications from Aro Equipment Corp., Bryan.

5. Road Service Jack

A road service jack styled in the garage jack manner but with quick removeable handle for easy handling is the latest Hein-Werner addition. With a capacity of 3000 lb., the unit weighs 73 lb. plus 11 lb. for the handle. It is intended for use on light service trucks in handling road service calls. Hein-Werner Parts Corp., Waukesha, Wis., will supply full details.

6. "Holgun" ¼-in. Drill

Well-named for its light weight and revolver-like appearance, Black & Decker's new "Holgun" is the latest development from this well-known tool maker. Its pistol grip and trigger switch adapt it for perfect control. Net weight is 2¾ lb. Capacity in steel is ¼ in., free speed, 1700 r.p.m. and overall length is 6¾ in. A new catalog sheet gives the full story and will be mailed on request to Black & Decker Mfg. Co., Towson, Md.

7. Low Cost Gas Analyzer

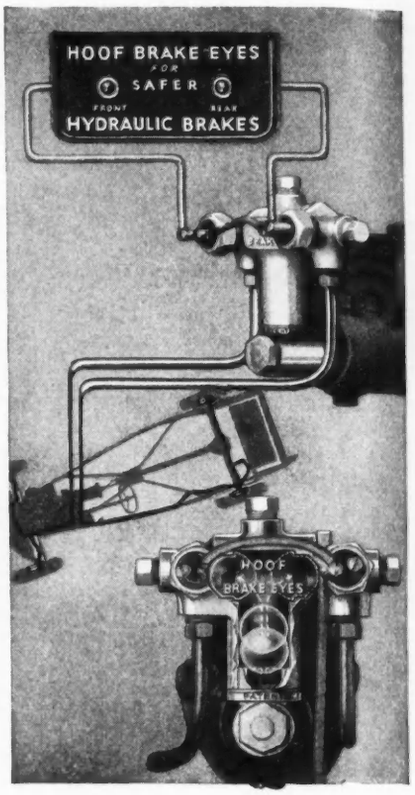
A new low-priced Weaver gas analyzer, with a net price below $35, should meet a long felt need for an efficient device of this type without imposing a heavy financial burden. Operating on the Wheatsone bridge principle which measures carbon dioxide content of exhaust gases, the unit may be used either in the shop or on the road.

A small tube attached to the tail pipe draws off sample gas without the need of a baffle plate and resulting back pressure. Power is supplied from any six-volt battery, on or off the vehicle. Complete details from Weaver Mfg. Co., Springfield, Ill.

Portable Testing Stand

A new display stand, which makes a handy rolling test laboratory in any shop, has been added to the Niehoff line of testing equipment. Of heavy all steel construction it provides space for Niehoff Condensometer, Coilometer and the new Generometer. The complete assembly provides portable

(Turn to Page 150, Please)



A SHOWCASE OF NEW PRODUCTS FOR FLEETS

Top left: The new Seiberling Safety Tire with saw-tooth tread. Top center: The Goodyear Studded Sure Grip Tire for off-the-road service. Top right: Hoof Brake eyes, an automatic device for locking out front or rear brakes in case of leaks. Opposite page left: The Sealed Power Bearing Wear Detector shown as in actual operation. Right: Do-Ray's Giant-Lite has 7-in. diameter and visibility of 1000 ft.

Seiberling Safety Tire

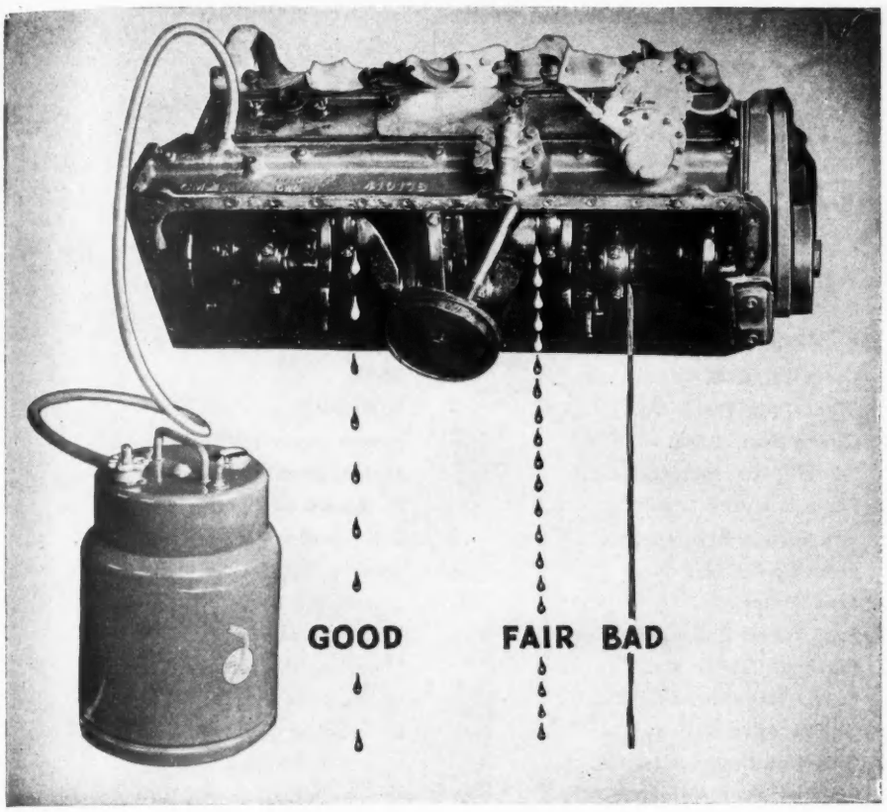
A seven-rib saw-tooth tread, scientific heat venting and use of a new "saf-flex" cord are features of a radically new Seiberling safety tire. Bullet-shaped vents pierce the shoulder and penetrate under the tread. As the tire revolves these vents open and close forcing out the heat. The new cord is heat-proofed, extremely durable, and reduces tire "growth" to the absolute minimum.

The tire is designed primarily for passenger car use and is available in sizes from 5.50 x 16 to 7.50 x 16. Full details may be had from the Seiberling Rubber Co., Akron, Ohio.

Goodyear Sure Grip

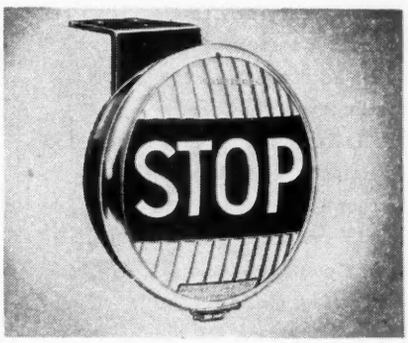
The new Goodyear Studded Sure Grip tire has been designed for passenger cars and light trucks to give utmost traction, primarily in off-the-road service.

The rugged studs, in angular bar arrangement, serve as cleats to insure forward or backward traction in mud, snow or slush. Double breaker strip cords are built in for extra strength and the Goodyear Supertwist cord is used in each ply. Fleetmen may secure details by addressing Goodyear Tire and Rubber Co., Akron, Ohio.



SECTION 7

TIRES..ACCESSORIES PARTS AND SUPPLIES



Hoof Brake Eyes

A device for locking out either front or rear brakes of a hydraulic system in the event that a leak should occur has been introduced by the Hoof Products Co. Known as "Brake Eyes" the device is attached in series with the master brake cylinder. Lines from it run to front and rear brakes. A balanced neoprene ball moves up and down with the fluid in normal operation, but should either half of the system fail, the ball is forced into a special seat by hydraulic pressure and immediately seals off the defective section.

A second unit attaches to the dash and provides twin indicating lights. If either light fails, the driver knows at once that only half his brakes are functioning. Full details may be had by writing the Hoof Products Co., 162 N. Franklin St., Chicago, Ill.

Bearing Wear Detector

Realizing the extreme importance of checking bearings as well as rings as a cause of excessive oil consumption, the Sealed Power Corp has designed a simple yet positive bearing wear detector. It consists of a convenient pressure oil can fitted with oil line and air valve.

In operation, the truck's oil line to the gage is removed and the line from the bearing wear detector attached in its place. The test tank should be preloaded with oil and air. As oil is forced into the bearing line dropping may be measured by count from each connecting rod, main and camshaft bearing. A simple specification chart makes it easy to judge condition. The oil pan must be dropped, of course.

Not only is it possible to check bearings and out-of-round conditions with the detector, but also to check for oil line leaks, to track down the cause of bearing failure, and to check oil flow to the piston pins, etc. An extremely useful device for any fleet shop. For details, write the Sealed Power Corp., 500 Sanford St., Muskegon, Mich.

Giant Stop Light

To provide greater safety and visibility, Do-Ray has announced a new oversize stop light. The Giant-Lite, as it is called, has a brilliant ruby lens that measures 7 in. in diameter. It uses a 32-cp. bulb and can be seen easily at a distance of 1000 ft. Waterproof, dust-proof, and vibration-proof, it is made of heavy-gage steel, black baked enamel finish with chrome-plated brass door.

Model 73 is also available with white lens for use as a brilliant back-up lamp. Furnished with either flush type mounting or sturdy angle bracket. For full details, write the Do-Ray Lamp Company, 1458 S. Michigan Ave., Chicago, Ill.

"Softweld" Electrode

A new heavily-coated Lincoln electrade of the shielded arc type has been designed for depositing a soft machineable alloy on cast iron. The non-ferrous coating permits the weld to flow over and bind to the cast iron with a minimum of penetration or heating of the base metal. It is particularly valuable for correcting machining errors, filling up defects or for providing a very soft machineable weld. Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio, will send full details.

Improved "Dag" Graphite

"Dag" brand colloidal graphite is now available in higher qualities than heretofore, the particles being of much smaller size. The top grade will contain particles slightly larger

(Turn to Page 124, Please)

NATIONAL MOTOR TRUCK SHOW, Inc.

Commerce Hall, Port Authority Bldg., New York, Nov. 11-17

EXHIBITORS' LIST

(As of Oct. 20, 1938)

Air Cooled Tires Co.
Air Cooled Motors Corp.
Almetal Universal Joints Co.
American Bosch Corp.
Arrow Safety Device Co., Inc.
Autocar Company
Baker-Raulang Co.
Bendix Products Corp.
Bendix-Westinghouse Air Brake Co.
Biehls Auto Body Works
Bowser & Company, Inc., S. F.
Brockway Motor Company, Inc.
Buda Company, The
Butler Mfg. Co.
Chevrolet Motor Company
Clark Equipment Co.
Cleveland Pneumatic Tool Co.
Colonial Beacon Oil Co.
Commercial Car Journal
Consolidated Decalcomania Co.
Continental Motors Corp.
Cummins Diesel Engine Co. of N. Y.
Cummins Engine Co.
Davis Welding & Mfg. Co.
DeLuxe Products Corp.
Dempster Bros., Inc.
Detroit Compensating Axle Co.
Diamond T Motor Car Co.
Dietz Co., R. E.
Divco-Twin Truck Co.
Dodge Bros. Corp.
Farrell Manufacturing Co.
Federal Motor Truck Co.
Fitz Gibbon & Crisp, Inc.
Fleet Owner List Co.
Ford Motor Co.
Four Wheel Drive Auto Co.
Fruehauf Trailer Co.
Fuller Manufacturing Co.
Galion Allsteel Body Co.
Gar Wood Industries, Inc.
General Accessories Co.
General Motors Overseas Corp.
General Motors Truck & Coach
Hegeman-MacCormack
Heil Co.
Hercules Motors Corp.
Hercules Steel Products Co.
Hoffman, W. W.
Imperial Brass Mfg. Co.
International Harvester Co.
Klemm Mfg. Co.
Mack International Motor Truck Corp.
Marmon-Herrington Co., Inc.
Merrill Spring Co., E. R.
Metropolitan Body Co.
Midland Steel Co.
Motor Improvements, Inc.
Motor Wheel Corp.
N. American Sportsmen's League
Pak-Age-Car Co.
Quaker City Iron Works
Reo Motor Car Co.
Scully Signal Co.
Silent Hoist Winch & Crane Co.
Sterling Motor Corp.
Studebaker Corp.
Thornton Tandem Co.
Timken-Detroit Axle Co.
Timken Roller Bearing Co.
Truckstell, Inc.
Trucktor Corporation
W. G. B. Oil Clarifier, Inc.
Wagner Electric Corp.
Walker Vehicle Co.
Walter Motor Truck Co.
Waukesha Motors Co.
Wheaton Brass Works, A. W.
Wheels, Inc.
White Co.
Young Windows of America

New Truck Registrations by Makes by Months

	Auto-car	Brock-way	Chev-rolet	Diam-ond T	Dodge	Fed-eral	Ford	G.M.C.	Hud-son	Inter-nat'l	Mack	Ply-mouth	Reo	Ster-ling	Stew-art	Stude-baker	White Indiana	Willys	Misc.	Total
January.....1938	129	64	10,137	335	3,070	118	9,114	1,746	99	4,501	254	668	216	16	27	158	288	176	227	31,343
January.....1937	130	102	13,975	828	3,673	199	16,230	2,749	278	6,098	382	208	344	22	89	167	583	125	300	46,482
February.....1938	95	57	8,991	338	2,622	109	7,687	1,401	81	3,763	217	562	182	9	19	144	316	138	238	26,969
February.....1937	112	115	7,777	580	4,904	205	16,100	2,987	355	5,136	363	692	305	25	101	215	538	57	292	40,859
March.....1938	110	86	12,233	380	3,666	136	9,898	1,965	77	5,256	352	769	283	17	31	161	394	174	303	36,291
March.....1937	179	140	16,924	815	6,337	236	20,386	4,122	539	5,689	476	1,104	484	23	147	465	647	76	299	59,088
April.....1938	119	127	11,719	393	3,575	136	9,287	1,917	78	4,810	366	757	251	26	43	184	368	175	341	34,672
April.....1937	228	184	21,974	863	3,935	258	22,241	4,671	482	6,710	586	1,143	378	43	118	706	809	107	346	65,782
May.....1938	193	159	10,659	360	3,171	93	8,918	1,810	68	4,281	382	662	287	25	45	221	364	168	340	32,206
May.....1937	197	183	20,146	816	5,893	294	19,884	4,416	489	7,071	579	1,447	411	27	120	701	783	77	440	63,974
June.....1938	235	116	9,912	332	3,055	95	8,427	1,730	65	4,045	317	681	213	21	38	158	308	196	288	30,232
June.....1937	197	139	16,703	644	6,048	223	17,414	4,035	554	6,681	536	1,634	435	33	92	643	668	82	374	57,135
July.....1938	129	99	11,226	382	3,236	117	9,425	1,675	67	4,782	347	660	264	34	36	116	337	182	362	33,478
July.....1937	281	152	17,809	764	6,508	225	18,934	4,237	579	7,539	622	1,715	480	34	107	622	667	99	312	61,686
August.....1938	88	111	11,268	397	3,286	125	9,471	1,909	61	5,361	370	593	231	23	28	209	289	158	253	34,231
August.....1937	174	134	19,477	665	6,906	161	16,526	4,529	539	7,700	430	1,664	337	15	93	556	520	105	341	60,872
Eight Months...1938	1,100	819	87,619	3,020	26,121	936	73,463	14,353	806	37,416	2,628	5,473	1,966	171	269	1,366	2,693	1,385	2,381	263,785
Eight Months...1937	1,501	1,149	137,404	6,211	45,045	1,825	150,412	32,335	3,901	53,657	4,007	9,854	3,255	235	877	4,143	5,276	728	2,820	464,635
% Change...8 Mos.	−27	−29	−36	−51	−42	−49	−51	−56	−84	−30	−34	−44	−40	−27	−69	−67	−49	+90	−15	−43

YOUR FLEET CAN BE EXIDE-EQUIPPED

No matter what makes are represented in your fleet, you can enjoy the dependability, long life, and low cost of battery maintenance which Exides consistently bring to operators in every corner of the country. These are rugged, powerful, long-lasting batteries built for day-in and day-out service . . . built to start your trucks or commercial cars in any weather.

The line of Exide "Commercials" fits 90% of all commercial vehicles. The Exide heavy-duty line fits large trucks of every make. Even Diesel-powered units have a line of Exides designed for them. There's no reason at all why you shouldn't start right now enjoying the type of service and economy you know you'll get with Exide. If you now use Diesel engines or expect to, write us for the free booklet, "Electric Starting of Diesels." It gives the facts.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
COMMERCIAL TYPE BATTERIES
WITH MIPOR AND SLOTTED RUBBER
"MIPOR," Reg. U. S. Pat. Off.

To mark the fiftieth anniversary of Exide Batteries, a handsome souvenir booklet has been prepared, illustrating the essential part these batteries play in daily life. Write, and we will gladly send you a free copy.

NEWS

August Truck Sales Up

New truck registrations in the United States, indicative of retail sales for the month of August, totaled 34,231 units. This is the latest available figure and shows a slight upturn from July when 33,476 units were registered. In August, 1937, sales were 60,872.

Truck production in the U.S. and Canada during August totaled 35,249 units compared with 38,330 in July. The September figures, just in, show a further decline to a low of 20,174. The August, 1937, figure was 87,802 and September, 1937, 55,033.

For the first nine months of 1938 truck production reached a total of 387,166 units, compared with 759,890 in the corresponding period a year ago.

For a detailed study of new truck registrations by makes by months, turn to page 62 of this issue.

Hours of Service Case Reopened

Rehearing of the case of ICC regulations governing the maximum hours of service of drivers will start Nov. 4 at the Sherman Hotel, Chicago, before Examiner R. W. Snow. The original effective date of Oct. 1 has been postponed until Dec. 31.

A. C. Seyfarth New IHC A. M.

Retirement of Frank W. Heiskell as advertising manager of the International Harvester Co., after 45 years of service, has been announced. Mr. Heiskell has been

Frank W. Heiskell (left) and A. C. Seyfarth

succeeded by A. C. Seyfarth, previously assistant advertising manager.

Carroll E. Johnson, advertising copychief since 1915, succeeds Mr. Seyfarth as assistant advertising manager.

SAE Transportation Program

The program of the National Transportation Engineering Meeting of the Society of Automotive Engineers to be held during show week is:

Nov. 14—2 P.M., "Trends in Engine Design" by F. S. Baster, White Motor Co., and "Tire Sizes—Not More but Better" by Merrill C. Horine, Mack Trucks, Inc.

Nov. 15—10 A.M., "Diesel Electric Bus Drives" by G. W. Wilson, General Electric Co. 2 P.M., "Instrumentation For Maintenance Test and Procedure of Electrical Equipment" by W. H. Yenni, Joseph Weidenhoff, Inc., and W. A. Roberts, Rappuhn Corp.

Nov. 16—10 A.M., "New Kinks in Live Truck Operation" by Henry Jennings, COMMERCIAL CAR JOURNAL. 2 P.M., "Trends in Commercial Vehicle Spring Suspension" by N. E. Hendrickson, Mather Spring Co.

USL Enlarges Battery Facilities

Because of a substantial increase in its volume of automotive battery business resulting from important contracts recently received, the USL Battery Corp., is devoting the entire facilities of its Niagara Falls factory to the manufacture of automotive, radio and farm lighting batteries.

Private Owner Council Endorsed

Representatives of midwest industries and farm groups, meeting in Chicago last month, unanimously endorsed the aims and purposes of the National Council of Private Motor Truck Owners.

The group criticized efforts to re-establish a monopoly in transportation by proposals in the states and at Washington to place motor trucks of industry and agriculture in the same category as for-hire transportation agencies by arbitrary regulation and taxation under the jurisdiction of utility commissions.

SAE Nominates '39 Officers

W. J. Davidson, general sales manager, Diesel Engine Div., General Motors Corp., has been nominated for the presidency of the Society of Automotive Engineers for 1939. Harry O. Mathews, Public Utility

(TURN TO PAGE 71, PLEASE)

FREE BOOKS

BOOKLETS — PAMPHLETS — CATALOGS

. . . a special selection made by the editors . . . for your copy write direct to the address given . . . to hurry it along mention Commercial Car Journal

Cooling System Encylopedia

A complete cooling system service manual which includes cooling system capacities on all popular cars and trucks as well as service instructions and a trouble shooting chart has been made available by the makers of Nor'way antifreeze. Although the manual normally is part of a package that goes with the antifreeze, a limited number have been made available to fleetmen without obligation. It is a really worthwhile addition to the fleet file, but remember, the supply is limited. Address Commercial Solvents Corp., 230 Park Ave., New York.

Tire Hand Book

For the fleet operators who would like to have a concrete measuring stick of the effect of load and speed on tires, Goodrich has prepared a 66-page handbook. There is really a mass of information crowded between its covers. Better write soon to B. F. Goodrich Co., Akron, Ohio.

Mack C.O.E. Brochure

Listing specifications and detailed descriptions of the new Mack C.O.E. models, Mack Trucks, Inc., has prepared a colorful eight-page brochure, handsomely illustrated. A copy will be in the mailbag pronto if request is made to Mack Trucks Inc., 48th Ave. and 34th St., Long Island City, N. Y.

Cleaning Compound Data

For those who encounter difficulties in cleaning external surfaces as well as greasy engines and parts Oakite has prepared a revised and enlarged booklet giving full details about a new oil-soluble emulsifier for use in cold solutions. Even for those who feel they have the situation well in hand, there is some worthwhile information. To get your copy, address Oakite Products, Inc., 14 Thames St., New York.

Websterizing Process

The Websterizing Process—an interesting pamphlet explaining new developments in methods of retreading and recapping tires, describes causes of tread separation, rapid tread wear, and tells how to eliminate them. It contains suggestions for establishing better maintenance control over tires in fleet operation. Write to the Webster Rubber Co., Warren, Ohio.

M-R-C Interchangeability Table

An interchangeability table for ball bearings is no small undertaking, but M-R-C has come through in fine shape. The new booklet spots the correct M-R-C bearing number to replace any number of any other make bearing. To get a copy, write M-R-C Bearing Service Co., Division of Marlin Rockwell Corp., Jamestown, N. Y.

Colloidal Graphite Information

The how and why of the graphoid surface is the latest subject discussed in the technical series of the Acheson Colloids Corp., Port Huron, Mich. Readers interested in the theory and application of non-oily yet unctuous graphite surfaces may apply direct asking for Bulletin 220.4.

NEWS

(CONTINUED FROM PAGE 66)

Engineering and Service Corp., has been nominated vice-president of the Transportation and Maintenance Activity and Carl J. Bock, General Motors Truck, of the Truck, Bus and Railcar Activity. David Beecroft is nominee for treasurer.

Truck Show Invites 20,000

Indications of swiftly growing interest on the part of fleet owners from as far west as the Pacific coast in the New York National Motor Truck Show have prompted the show management to issue special invitations to approximately 20,000 fleet operators in every state in the nation.

Ethyl Establishes Tune-Up School

Establishment of a course in the engineering principles of automobile tune-up for mechanics and students of technical and trade schools throughout the United States has been announced by Ethyl Gasoline Corp. as an extension of its nation-wide clinical education system.

Planned to supplement practical and theoretical knowledge, the advanced study program will be carried out in motor clinics during the next two years in more than 200 cities.

Ahlberg Represents Bower

Bower Roller Bearing Co., Detroit, announces the appointment of Ahlberg Bearing Co. as its exclusive sales representative for industrial and automotive replacement sales.

Laboratory Research and Advertising

Unusual interest has been reported among fleet owners as well as in the truck trade and industry, in a series of articles, based on laboratory tests, appearing as paid advertisements in Commercial Car Journal. The tests were made under the direction of A. H. Nellen, Director of the Development Department of Lee Tire & Rubber Co. The articles were written by Mr. Nellen and appear under his signature in this unusual and highly modern series of advertisements.

Resembling in their contents, matter and form of presentation the type of paper read at engineering and other scientific meetings, the first two theses in the series discussed "'Weighing' Truck Tire Quality" and "Comparative Heat Generation in Truck Tire Treads and Carcasses."

"Growth of Pneumatic Tires, Comparing Rayon Cord with Cotton Cord" is the provocative title of the third article in the series, appearing in this issue. The "growth" referred to is the permanent enlargement which pneumatic tires attain in service. The timeliness of the theme, it is pointed out by executives of the company, is evidenced by current discussions of the same subject in general news-magazines.

The use of the results of such laboratory research, authored by the research engineer, in its advertising copy is regarded by the Lee company as a positive contribution to the advancement of advertising generally.

ATA Names More Speakers

Major H. E. Crawfurd, president of the Association of Road Operators, Ltd., of Great Britain, and Chester H. Gray, director of the National Highway Users Conference, have been added to a list of prominent speakers on the program of the American Trucking Association, Inc., fifth annual convention being held in Detroit, Oct. 31 to Nov. 3.

American Bosch to Change Name

Stockholders of United American Bosch Corp. have voted to change the name to American Bosch Corp.

Karl Wise Named by Bendix

Karl M. Wise has been made director of engineering of Bendix Products Division of Bendix Aviation Corp.

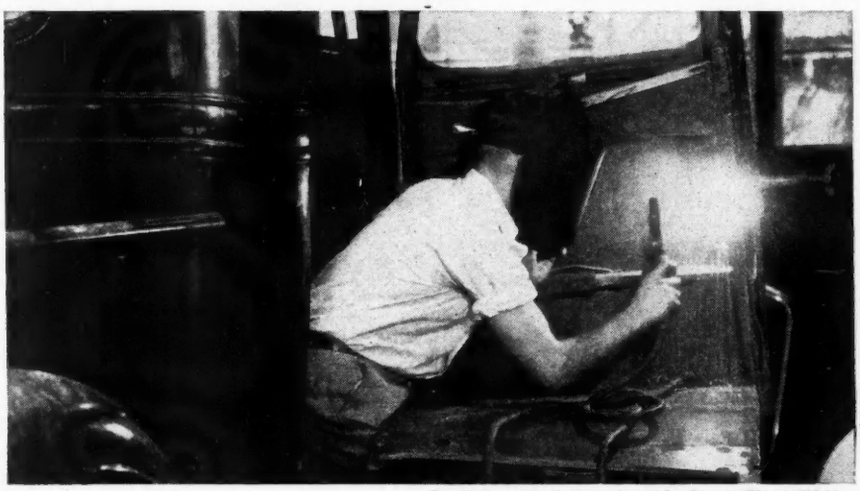
Hills Heads Timken Sales Division

Yale D. Hills has been made manager of distributor sales for the service-sales division of the Timken Roller Bearing Co.

Anderson Resigns

Bohn Aluminum & Brass Corp. announces the resignation of David E. Anderson as chief engineer.

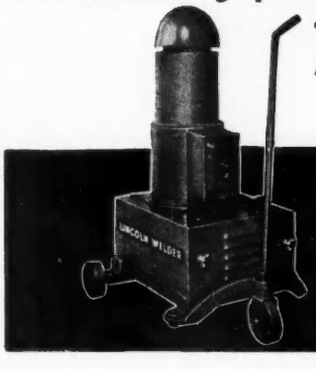
"OUR LINCOLN WELDER IS THE MOST VALUABLE PIECE OF EQUIPMENT IN THE SHOP"



Installing a guide for door glass with a Lincoln Electric Welder.

● The service department of this large fleet owner in Houston, Texas, has found their portable Lincoln "Junior" an indispensable piece of repair equipment. Mr. Krause, the shop foreman, says, "I do not know how we ever got along without this electric welder. We now weld many jobs, body work for instance, in one-tenth the time formerly required because we can apply this welding in tight corners and on any number of cars with a minimum of dismantling and without refinishing of painted surfaces. Our mechanics find this welder simple to operate under all welding conditions."

You too can save time and money in the repair of cars and trucks with this Lincoln Welder. It will weld or hard-face all metals and alloys at minimum cost with maximum ease because it is of DC motor generator type. It is as handy and reliable as any of your electric tools such as drills and grinders. Investigate this welder today. Consult the nearest Lincoln office or mail the coupon.



THE LINCOLN ELECTRIC CO.

Largest Manufacturers of Arc Welding Equipment in the World

THE LINCOLN ELECTRIC CO.
Dept. AF-552, Cleveland, Ohio

Send a free copy of Bulletin 314 describing the Lincoln 150-amp. welder.

Name _____ Position _____

Company _____

Address _____

City _____ State _____

When writing to advertisers please mention Commercial Car Journal

(Advertisement)

GROWTH of PNEUMATIC TIRES

Comparing Rayon Cord With Cotton Cord

By A. H. Nellen

Director, Development Department,
Lee Tire & Rubber Company

While actual experience in the hands of users becomes the final measure of success of any new tire design or construction, nevertheless certain tests which may be made more quickly allow us to predict with a degree of accuracy what advantages or disadvantages a new construction may possess.

This article on the growth of pneumatic tires should be of interest, particularly to fleet owners and operators, as it presents some data comparing rayon and cotton cords in tires which have not heretofore been published.

The truthfulness and accuracy of the tests referred to in this article, like those in the first (September) and second (October) articles, require no further endorsement than that they are presented under the signature of the Director of LEE's Development Department, A. H. Nellen.

BECAUSE pneumatic tires are made of resilient or "stretchy" materials, namely rubber compounds and cord, it is only natural that when they are subjected to internal air pressure together with flexing strains imposed by rolling on the road, they stretch or enlarge to some extent. It is also natural that part of this stretch or enlargement should become permanent, since no material when stretched returns to exactly its original length. This *permanent* enlargement which pneumatic tires attain in service we call tire "growth," and the difference in cross section and outside diameter measurements between the original inflated dimensions and the final inflated dimensions we call the percentage of tire growth.

While a small percentage of growth may not seriously affect the service which the tire may render, nevertheless it is generally recognized that everything else being equal, the lower the growth the better the tire. Many patents have been taken out on tire constructions designed to reduce growth, on the premise that improved service would naturally result, and this has been admitted by the patent office.

When tires are run on a test-wheel test, such as has been previously described, (1) the same type and extent of growth takes place in the tires that would occur under very severe road conditions; but with temperatures, speeds, inflations, etc., under accurate control in test-wheel tests comparative growth figures can be determined more accurately than in any other way. The figures presented in this article were all obtained in this manner.

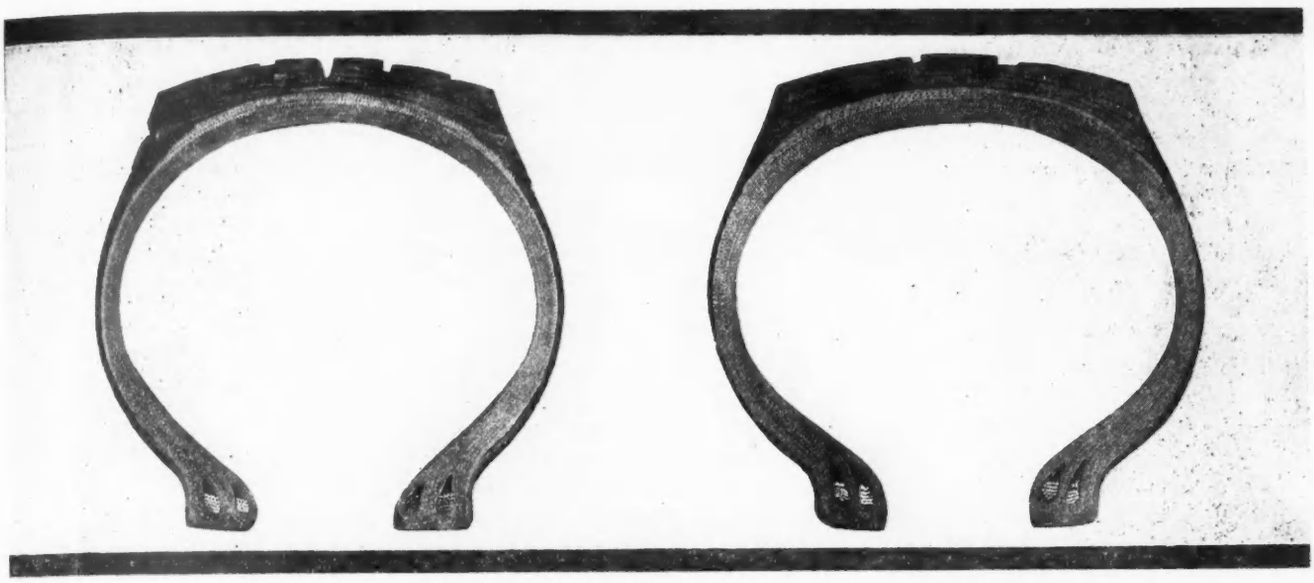
When tires made with rayon cord were announced, Lee was naturally very much interested in this development since rayon, when dry, has very low stretch characteristics and Lee has been the pioneer (2) in low stretch cotton cord development. In fact one of the qualities which have made Lee tires manufactured with LEE Double-Life cord outstanding for long service, is the greatly reduced growth of these tires compared with

(1) "Weighing Truck Tire Quality." Commercial Car Journal, September '38.

(2) Pats. 2,028,003
Re. 20,316
2,131,636

(Advertisement)

Sections of Tires After Endurance Test



Lee Double-Life Cord Tire — FIG. I — Rayon Cord Tire

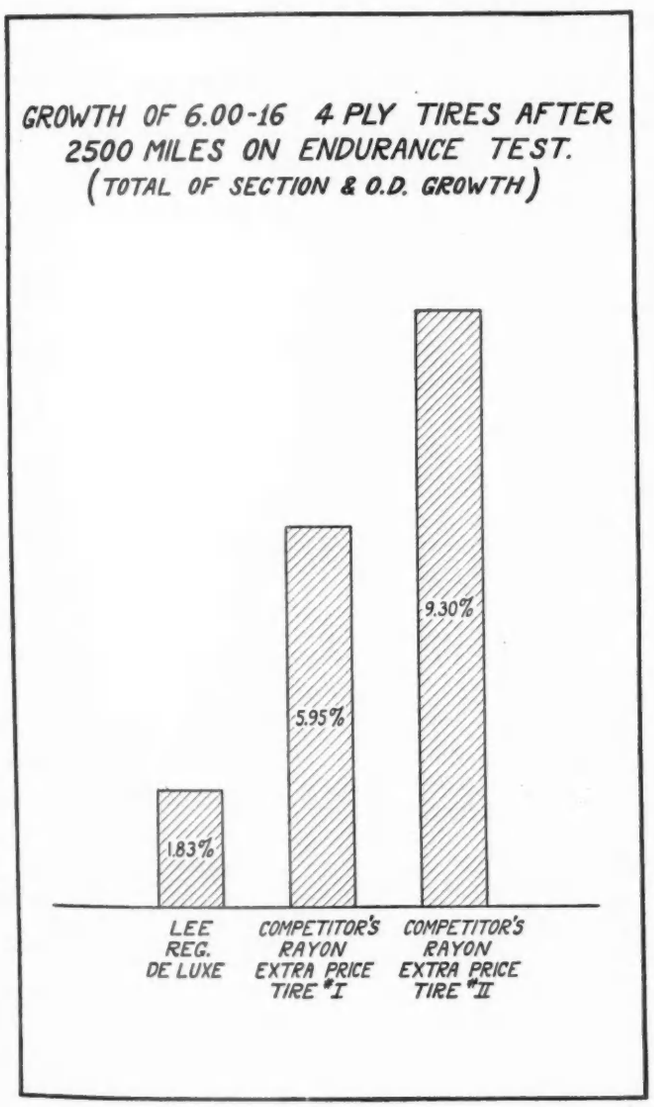

GROWTH OF 6.00-16 4 PLY TIRES AFTER 2500 MILES ON ENDURANCE TEST.
(TOTAL OF SECTION & O.D. GROWTH)
1.83%
5.95%
9.30%
LEE REG. DE LUXE
COMPETITOR'S RAYON EXTRA PRICE TIRE #I
COMPETITOR'S RAYON EXTRA PRICE TIRE #II

FIG. II

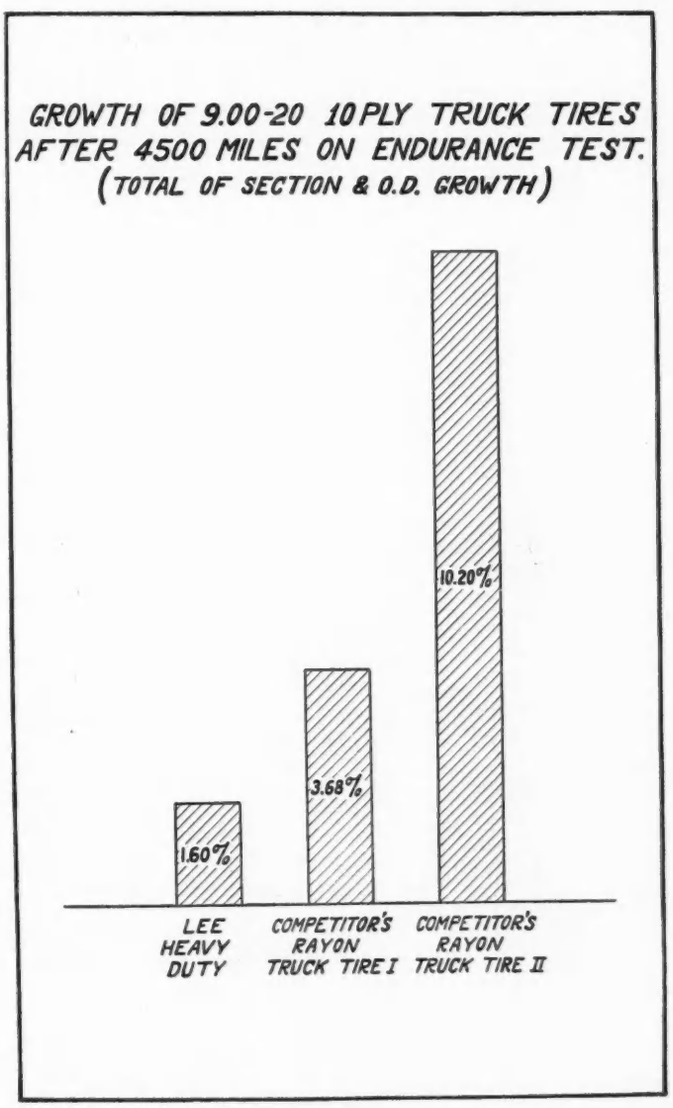

GROWTH OF 9.00-20 10 PLY TRUCK TIRES AFTER 4500 MILES ON ENDURANCE TEST.
(TOTAL OF SECTION & O.D. GROWTH)
1.60%
3.68%
10.20%
LEE HEAVY DUTY
COMPETITOR'S RAYON TRUCK TIRE I
COMPETITOR'S RAYON TRUCK TIRE II

FIG. III

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those made with the ordinary non-compact, high stretch cord.

It was expected that a tire made with a rayon carcass would have a growth as low as, or lower than a Lee tire with a Double-Life cotton cord carcass. Surprisingly, however, the opposite was true on the first two tires tested, and in fact the percentage of growth on the rayon cord tires was greater than we had ever observed on *any* cotton cord tire. We decided then to make a thorough study of *all* makes of rayon cord tires in the 9.00-20 size and also to test some of the extra priced 4 ply rayon tires in the 6.00-16 passenger car size.

We found that after 4500 test-wheel miles on the endurance test all of the 9.00-20 rayon tires grew excessively, actually the total of average section growth plus average outside diameter growth was 3.68% as compared with 1.60% for the regular 9.00-20 Lee tire. On a similar test after running 2500 test-wheel miles the 6.00-16 rayon 4 ply passenger car tire grew 5.95% as against 1.83% for the Lee Regular DeLuxe 4 ply tire.

The effect of moisture on rayon goods of all kinds is to soften them very considerably and if placed under strain while wet they stretch or tear very easily. For this reason, rayon stockings or underwear must be carefully washed and rinsed by hand to prevent damage while wet. Also, if such a garment as a rayon skirt becomes wet by rain while worn, it is likely to stretch considerably and become unfit for further wear. We recognized this inherent weakness of rayon, and also were aware of the fact that rubber compounds absorb moisture, especially when flexed, this property of rubber having been described in rubber technical literature (3). We therefore completely immersed a 9.00-20 rayon tire and a 6.00-16 rayon tire in cold water for a period of 72 hours, then dried them completely. These tires were not cut or treated in any manner to give the moisture free access to the rayon cords but were simply immersed so that the water might soak into the rubber and then to the rayon. This is not as severe treatment as a tire gets on a rainy day when running on a wet road. These tires were given the test-wheel test, and in the case of the 9.00-20 rayon tire the growth at 4500 test-wheel miles reached the excessive amount of 10.20%, while the 6.00-16

(3) Winkleman & Croakman, "Water Absorption of Rubber Compounds." Industrial and Engineering Chemistry, New York, Vol. 22, No. 12, December '30.

S. J. Skinner and T. J. Drakeley, "Water Absorption by Rubber." Transactions of Institution of the Rubber Industry, London. Vol. 8 #2, August '32.

H. A. Daynes "The Measurement of Water Absorption by Rubber." India Rubber Journal, London, Vol. 84 #13, September 24, '32.

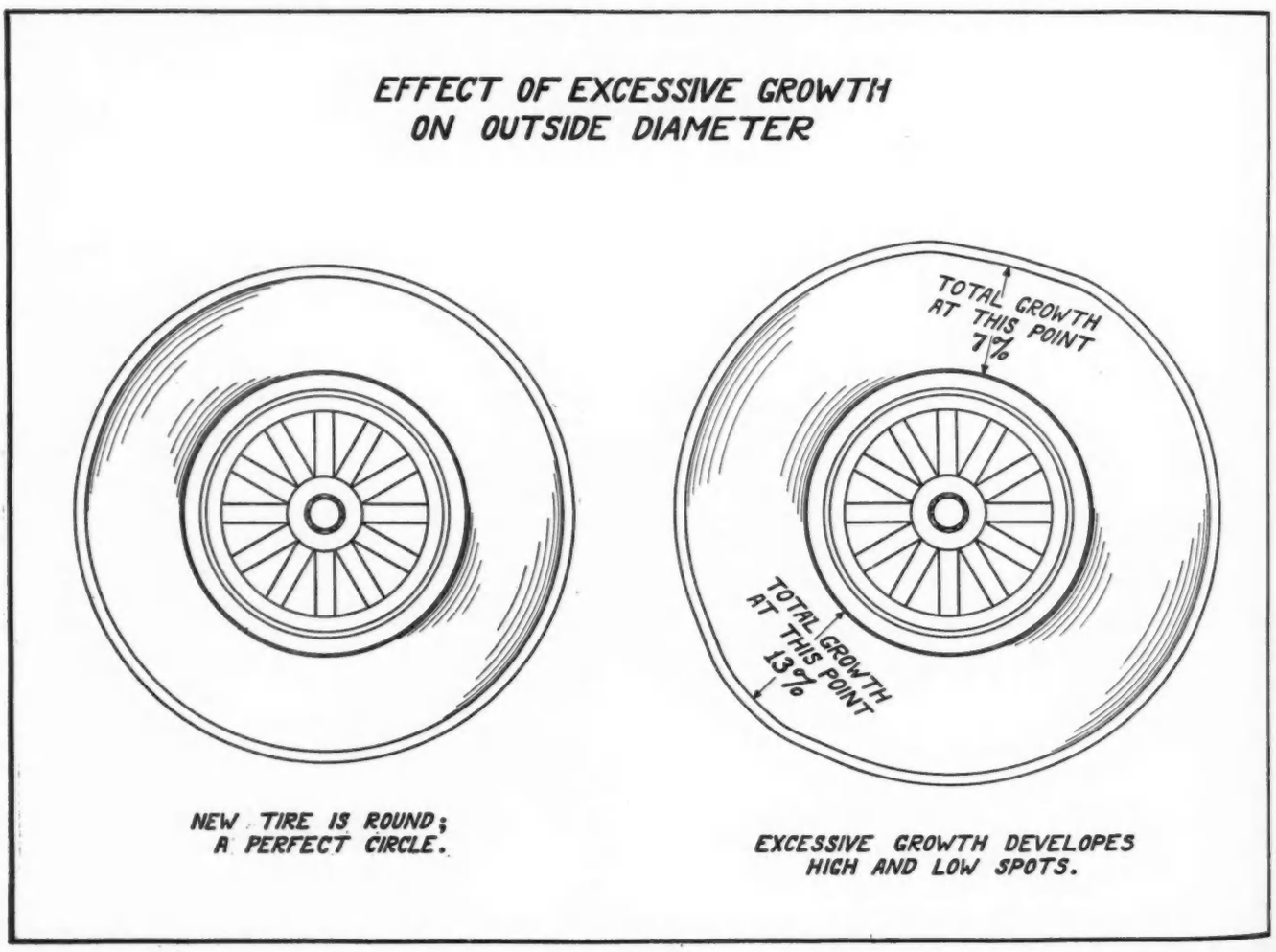
EFFECT OF EXCESSIVE GROWTH
ON OUTSIDE DIAMETER
TOTAL GROWTH AT THIS POINT 7%
TOTAL GROWTH AT THIS POINT 13%
NEW TIRE IS ROUND; A PERFECT CIRCLE.
EXCESSIVE GROWTH DEVELOPES HIGH AND LOW SPOTS.

FIG. IV

(Advertisement)

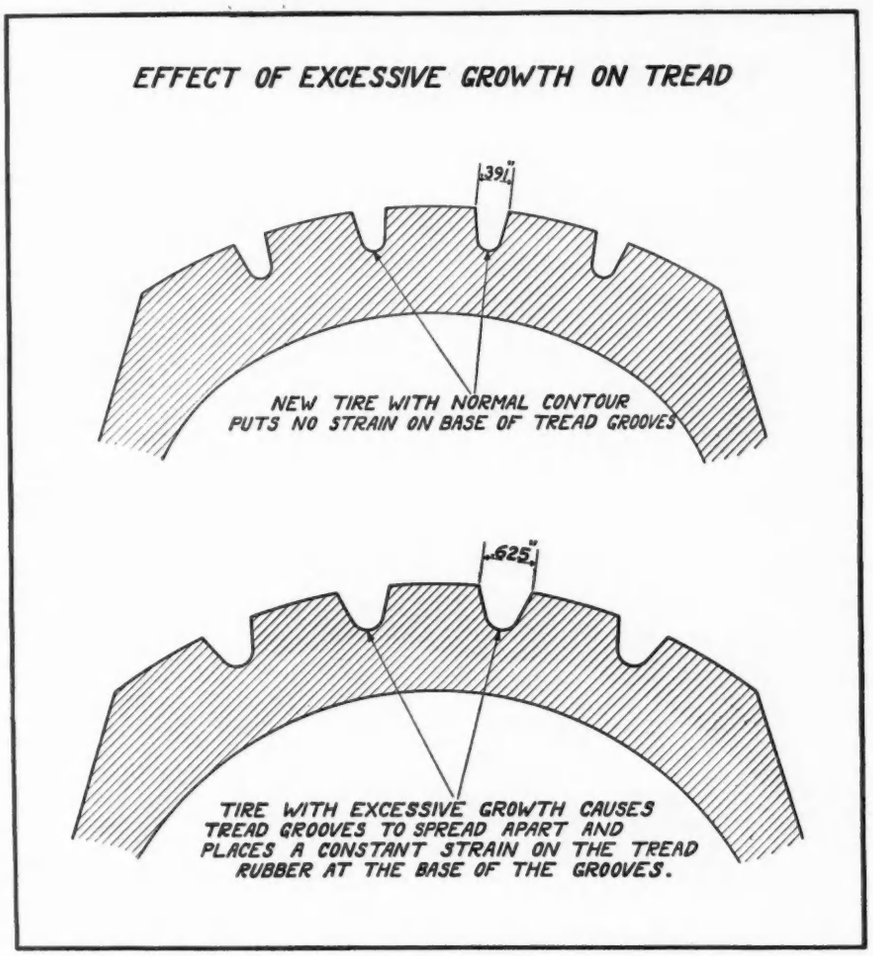
EFFECT OF EXCESSIVE GROWTH ON TREAD
.391"
NEW TIRE WITH NORMAL CONTOUR
PUTS NO STRAIN ON BASE OF TREAD GROOVES
.625"
TIRE WITH EXCESSIVE GROWTH CAUSES
TREAD GROOVES TO SPREAD APART AND
PLACES A CONSTANT STRAIN ON THE TREAD
RUBBER AT THE BASE OF THE GROOVES.

FIG. V

rayon tire showed a growth of 9.30% at 2500 test-wheel miles.

Immersion in water does not affect the growth of tires made with Lee Double-Life cord.

In the photograph in Figure I sections are shown taken from a 9.00-20 Lee Double-Life Cord tire and a 9.00-20 rayon tire after endurance test. The great enlargement of the rayon tire is readily seen.

Figures II and III show graphically the comparative growth percentages of 6.00-16 and 9.00-20 Lee Double-Life and rayon tires, in each case rayon tire I is the regular tire and rayon tire II the tire after 72 hours of immersion in water.

Figure IV illustrates an inflated 9.00-20 tire compared with a similar tire which has attained the excessive growth of 10.20%. When a tire grows to this extent, it cannot stretch uniformly throughout its entire circumference and the result is that "high and low spots" in the tire develop. These naturally cause wheel tramp, hard riding, uneven wear, etc. Also, if a tire with this excessive growth were mounted as a dual against a tire with normal growth, it would, naturally, take most of the load, due to its larger diameter and probably fail prematurely.

Another effect of growth is illustrated in Figure V. Here we see a cross section of the tread of a tire before and after excessive growth. The sectional growth has widened the tread and made the contour rounder; also it has widened the grooves and placed the rubber at the base of these grooves under considerable strain, which promotes tread cracking. Also, the entire surface of the tread rubber is under strain which makes it wear considerably faster and become much more subject to cutting and chipping.

Based upon the data here presented, we must conclude that rayon cord tires as manufactured today grow much more than Lee Double-Life Cotton Cord tires and therefore should be subject to the troubles which result from excessive growth.

Copies of this article, "Weighing Truck Tire Quality," "Comparative Heat Generation in Truck Tire Treads and Carcasses," and our booklet, "Facts About LEE of Conshohocken Tires made with LEE Double-Life Cord, U. S. Pat. Re.20316," will be gladly sent on request. Lee Tire & Rubber Company, General Office, Conshohocken, Pa.

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Legislative Circus

(CONTINUED FROM PAGE 24)

tions dealing with those subjects may reach the amazing number of 10,000 proposed measures. While no one can foretell accurately the actions of legislative bodies, certain developments can be foreseen. Some are leftovers from former legislative sessions, involving cases left unsolved, and others in which solutions were faulty. There will also be new demands from unexpected quarters.

All forms of transportation have been affected by a slackening demand —one of the inevitable accompaniments of a period of declining industrial activity. While all forms have been hit, public attention has been focussed almost exclusively on the case of the railroads. It has been the constant subject of press comment. The unfortunate financial condition in which most of the railroads find themselves, together with all of this publicity support, has spurred their legislative representatives to even greater efforts in attempts to restrict competition through legislation.

The railroads continue to imply by advertising and otherwise that the principal cause of their present difficulty is the result of "unregulated subsidized competition." They do this despite the fact that commercial highway transport is now fully regulated by the Interstate Commerce Commission and by practically all of the states, and despite the further fact that the total tax bill of the railroads is less than the taxes paid by the trucks alone.

They would require a certificate of public convenience and necessity from the I. C. C. before the construction of a new highway could be authorized. They would have the "commodities clause" extended to all forms of transportation, thus prohibiting transportation of a man's own goods in his own vehicle. They would prohibit Federal expenditures for the extension or improvement of highways where "adequate" rail transportation already exists. They would require highway carriers to "pay for the use of the highways and waterways a sum which would represent a fair return upon the amount of government expenditures for the improvement of such ways." They would even impose a system of tolls.

If an industry's creative power to cope with competition has been crippled by excessive control, the natural course would be to relieve the industry of those crippling influences. Unfortunately, the current practice is to "equalize" and handicap all others with even greater statutory control. When impotence is thus made equal and universal, there is no course left but for the government to take over all the cripples and spread the cost of their incapacity over the entire community.

Federal Legislation

The 76th Congress will convene Jan. 3. There will be staged a battle over the National Labor Relations Act—a battle embittered by the ill temper of the A. F. of L. and C. I. O. towards each other. Surely, there will be some changes in the law but those changes will not go far enough to make labor assume a responsibility equal to that of employers.

As hinted above, the Works Progress Administration will seek to perpetuate itself. This may come up through direct legislation or it may develop in the resubmission of the President's plan for reorganization. In any event, no Congressional leader has indicated the discontinuance of Federal relief contributions as an early possibility.

The price of grain is the lowest in years, and a real fight may be expected on triple A. Every possible effort will be made to establish a guaranteed profit on farm crops. Out of this may develop the Binderup plan of "commodity money."

When two extremes, as represented by Senator La Follette and Senator Pat Harrison, agree on a principle, that principle will receive consideration. The latter has said that there must be a broadening of the base as a means of getting more income tax from the citizens in the lower brackets "unless there is a pick-up in business." Despite his espousal of the problems of the little fellow, Senator La Follette has long favored this sort of taxation.

The chain store tax movement, successful in many states, struck an obstruction in Congress, but it is far from dead. The demands may be modified somewhat, and legislation that will retard the further expansion and growth of chains will probably result.

In accordance with the provisions of Section 225 of the Motor Carrier Act, 1935, the I. C. C. has begun its investigation on the need for Federal regulation of the size and weight of motor vehicles. Unless the 76th Congress should be a long, drawn out affair, the Commission's report and recommendations will scarcely be submitetd in 1939. Efforts will be made to broaden the Commission's regulatory power over motor carriers, but the extent to which these proposals will go is entirely too speculative to discuss at this time.

Taxation

The highway user, as a class, is subjected to more forms of taxation than is any other group. In addition to his ordinary taxes as a citizen, the motorist paid over one and a third billion dollars in special vehicle taxes last year. Threats of material additions to this burden now portend.

Increases in gasoline taxes are sought in Idaho, Indiana, Maine, Massachusetts, New Hampshire (to relieve real estate from taxation and possibly to pay for flood damage), New Jersey, North Dakota, Pennsylvania, Washington and Wisconsin. It will be remembered that an increase in Washington was prevented only by the Governor's veto in 1937.

The threat in Montana seems to have been postponed for the present. The third cent added to the motor fuel tax in Missouri by the last session now goes to the voters on a referendum. Undoubtedly the subject will be brought up again in the legislature regardless of the election results.

Attempts to reduce the soaring tax rate and to terminate so-called "emergency" gasoline impositions will be made in several states, including Arkansas (where the last reduction passed by the legislature was vetoed), Florida, Maryland, Massachusetts, Minnesota, Nebraska, New York, Ohio, Tennessee, and West Virginia.

A movement to increase the tax on diesel fuel (now generally taxed at the same rate as gasoline) is indicated in some of the western states. New Mexico now taxes diesel fuel 7½ cents per gallon compared to 5 cents tax on gasoline. An oil inspection bill, actually for revenue purposes, will be pushed in Washington State.

(TURN TO PAGE 78, PLEASE)

23 TIMES "ACROSS THE CONTINENT"

. . . . without a stop for repairs!

HAVE YOU ever stopped to figure that the oil and repair bills for *your* fleet might easily be a whole lot less?

This Southern fleet operator did. His trucks had a plenty tough run . . . *1200 miles* between Detroit and Jacksonville. That kind of heavy truck operation usually means sky-high oil and repair charges.

But this operator had a hunch. He believed one of the highest-priced oils on the market held the secret of low oil and repair bills.

He Took A Chance . . . And Won!

He switched to Gulfpride Motor Oil—the finest oil money can buy—and down went oil and repair costs with a bang! Here's what he wrote us: "*Checking our motor overhauls over a long period, we find our average mileage per repair job is seventy thousand.*"

70,000 miles between repairs—a distance greater than 23 times across the continent!

Unusual? Not for Gulfpride! Hundreds of fleet operators are discovering that this "Miracle Oil" slashes deep into maintenance costs.

Gulfpride is refined in a truly remarkable way . . . by Gulf's *exclusive* Alchlor process, *which starts refining where other processes stop!* This patented process, applied in addition to conventional methods, removes an extra 20% of waste and sludge from 100% Pure Pennsylvania oil!

Don't continue spending big money for run-of-the-mine oil and frequent repairs when Gulfpride will give you better lubrication at a lower annual cost. Fill up your fleet with Gulfpride—*now.*

Gulfpride

GULF

The world's finest motor oil

100% PURE PENNSYLVANIA...IN SEALED CANS ONLY

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(CONTINUED FROM PAGE 76)

Ton-mile taxes will again be an issue. Enactment or extension of such imposts will be proposed in Iowa, Maine and Nebraska. Repeal of present ton-mile levies will be considered in Alabama, Florida, Oklahoma and Tennessee. General tax increases may be sought in Idaho (with substitution of gross weight tax), Iowa, Missouri (chiefly falling on private trucks), Montana, Oregon (also possibility of municipal taxes), Pennsylvania and Washington. Oklahoma carriers may seek a flat fee basis.

The Indiana tire tax was declared unconstitutional by a trial court. It is now in appellant position, but indications of its unpopularity point to a possible restoration of the former weight tax.

Diversion and Dispersion

The befitting use of revenues is of equal importance with the quantity of taxes. The great wave of diversion seems to have reached its crest in 1936 and 1937. A demand for the proper application of special vehicle taxes has been voiced by Congress in Section 12 of the Hayden-Cartwright Act: " * * * it is unfair and unjust to tax motor vehicle transportation unless the proceeds of such taxation are applied to the construction, improvement and maintenance of highways * * *."

The last two years show a marked increase in the number of legislators who believe that it is unfair and unjust to divert these special tax revenues to other than highway purposes.

If these collections are used exclusively for the construction and maintenance of roads, they form an equitable measure of taxation as the assessment is measured by the "use" of the facility. Diversion, on the other hand, provides contributions for general governmental support that are not based on value of property, amount of income or ability of the taxpayer to pay. The farmer's contribution depends upon the distance he resides from his market. That of the salesman, businessman, laborer or truck operator depends upon the distance he must travel by highway in his daily occupation. It thus becomes a special impost based upon a variable yardstick. It is an indefensible measure of taxation if used for the support of the general government.

While the truth of these assertions is generally recognized, threats of new diversions will be present in many states including Connecticut and Maine. New York, the worst offender of the states, has gone so far in its diversion program that there seems little likelihood of there being any notable change as long as the present state administration remains in power.

The fight against the practice, either by amendment of existing laws or by securing constitutional safeguards, will be continued in Arizona, Delaware, Florida, Georgia, Idaho, Maine, Maryland, Massachusetts (stopped diversion this year, first time in eight years), New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, South Dakota and Utah. Alabama, California, Michigan and New Hampshire vote on anti-diversion amendments this fall. Amendments are before the legislatures of Indiana and Nevada for the required second action.

The extent of dispersion of highway revenues by local governmental subdivisions is much more difficult to catalog and combat. To ascertain the amount of this leakage is difficult since in many instances the sharing by cities and counties is entirely proper. The state-wide highway planning surveys now being conducted in forty-six states under the guidance of the U. S. Bureau of Public Roads are developing much information that should be most helpful to legislatures in determining the extent these funds are misapplied. If the local subdivisions cannot be depended upon to spend the monies allocated to them by the state for the purposes for which they were intended, then legislatures will be called upon to extend the power of state highway departments to include the control, at least the audit, of those expenditures by the lower units.

Increased demands for local sharing in state revenues, particularly by municipalities, are developing. The Arizona cities are demanding 20 per cent of the gas taxes. California municipalities desire a share of the state revenues now being allocated to the counties. The Citizens' Road Association of Missouri wants 20 per cent to go to the cities and 20 per cent to the counties. An initiative petition has been circulated in Oklahoma seeking a re-distribution of highway funds that will give 50 per cent to the counties and cities. The validity of this petition is now in the courts. A compromise has been reached in Washington under which the cities will demand 15 per cent of the gas tax at the next session. The general question of distribution is up in one form or another in Colorado, Connecticut, Kansas, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Mexico, Oregon, South Carolina, Utah, Vermont, Wisconsin and Wyoming.

In many states, this demand, as well as that for relief from real estate taxes, will be a strong force behind proposed increases of the gasoline and other highway taxes.

A proposed constitutional amendment to amend bond refunding provisions will be voted on in Arkansas.

Regulation

Carrier Regulation. Many amendments to existing carrier regulatory laws will be offered. Some will seek to harmonize state regulation with the Federal Motor Carrier Act. A new law will be proposed in New Jersey, and the extension of present Commission powers will be sought in Idaho and Utah. West Virginia's 1937 Act exempts certain trucks of lighter weight. There is some agitation for the elimination of the exemption. As a general thing, regulation of for-hire motor carriers is not only quite universal, but has become fairly well shaken down. From the legislative standpoint, it will be largely a matter of amendments to broaden, correct and refine.

Private Carriers. The situation involving the so-called "private carrier" is much more critical. This new classification embodies owners and operators of trucks not used for hire but used incidentally in the furtherance of ordinary business enterprise, or in other words, the "shipper-owner."

When the Motor Carrier Act was passed, obviously it was the intent of Congress to exclude any regulation of the private operator as a carrier. This intent was not carried through with complete success, and there may

(TURN TO PAGE 80, PLEASE)

STEPS UP MILEAGE BY 80%-and More! ..USERS REPORT

—that's why it is the GREATEST IMPROVEMENT IN TRUCK TIRES IN 20 YEARS

"TIRES rarely gave us 25,000 miles of service. We now have some 25 or 30 Goodyear YKL's in service that have averaged between 50,000 and 60,000 miles, and heat blow-outs are no longer the problem they were before we started using YKL."

WALSER TRANSPORTATION, INC.
Greensboro, North Carolina

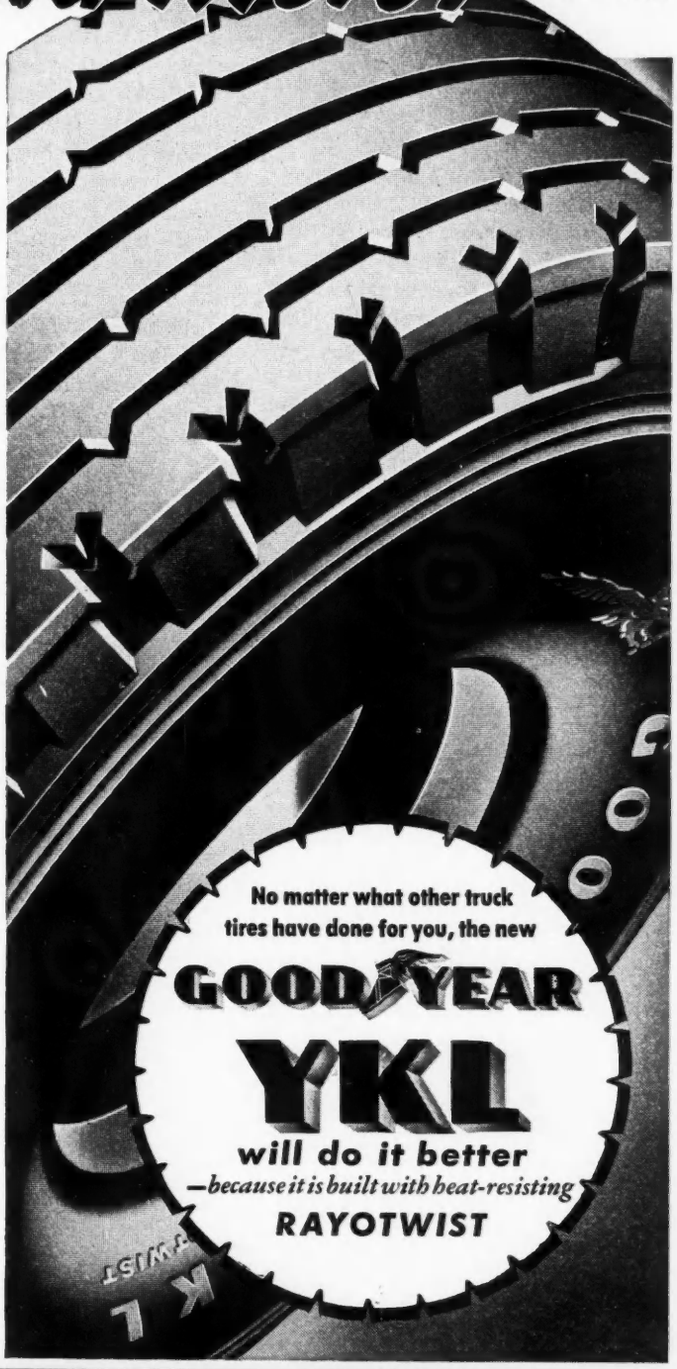
Hundreds of letters like this testify to mileage increases of 80% and more with the new Goodyear YKL truck tire.

This tremendous step-up in mileage results from the use of a new basic material in every ply—an amazingly tough, satin-like rayon cord, called RAYOTWIST, spun from cotton cellulose and like carbohydrates. It far excels ordinary tire fabric in resistance to heat — *the cause of 82% of all truck tire failures!*

Because of this, YKL's give you NINE standout advantages under even the severest conditions:

1. LONGER TREAD WEAR
2. LONGER BODY LIFE
3. GREATER BRUISE RESISTANCE
4. GREATER SAFETY FACTOR FOR OVERLOADS
5. GREATER SAFETY FACTOR FOR UNDER-INFLATION
6. HANDLES SPEED HEAT
7. GREATER RESISTANCE TO BRAKE DRUM HEAT
8. TAKES MORE RETREADS AND RECAPS
9. GREATER ACCIDENT IMMUNITY

Take the word of men who are using them—*Put on Goodyear YKL's and watch your mileage jump!*


No matter what other truck tires have done for you, the new
GOODYEAR
YKL
will do it better
—because it is built with heat-resisting
RAYOTWIST

FOR LOWEST COST PER MILE *Use*

THE GREATEST NAME IN RUBBER

GOODYEAR YKL

FOR TRUCKS • BUSES • TRAILERS

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(CONTINUED FROM PAGE 78)

be some attempts to broaden that Act so as to increase the shackles on the private operator.

Regulation of the private operator will be an issue in the legislatures of Arkansas, Illinois, Kansas and Minnesota. Possibly, California and Washington may be included also. During the past year, the Nebraska Railroad Commission issued an Order requiring all wholesalers, jobbers, manufacturers and distributors who use their own trucks, to appear and show cause why they should not be required to impose rates on their customers for the delivery of their wares, those rates to be equal to those charged by common carriers throughout the state. The Order also would have imposed a requirement on these private business enterprises to secure a certificate of public convenience and necessity. The reaction to this Order was so positive in its nature as to induce the Commission, after hearing, to dismiss the proceedings.

Shipper-owners in Texas undoubtedly will seek legislative relief from the serious situation imperiling their status as the result of the adverse court decision in the New Way Lumber Company case. Remedial legislation there was vetoed in 1937. Efforts will be made in Colorado to relieve the private operator from some of the existing restrictive regulations and taxes. Petroleum commission agents in the State of Washington face possible attempts to bring them under the jurisdiction of the Public Service Commission.

Itinerant Trucking. Individual truck owners engaged in buying grain, fruit and other farm products will be the recipients of special attention in a number of states including Arkansas, Arizona, Iowa, Kansas, Minnesota, Missouri (the center of the demand for legislation), Nevada, New Mexico, Texas and the Dakotas. Such legislation will seek to include the itinerant vendor or transient peddler.

It is claimed by established dealers, elevator men and commission merchants that these independent buyers and sellers of farm products disrupt the markets, depress the prices and confuse the industry. Restrictions will be sought. The simplest method at hand seems to be to place them under the jurisdiction of the state railroad or utilities commission, and thus rate them as carriers, possibly along the lines indicated in the New Way Lumber Company case.

A real danger lies in this type of legislation. To regulate them as carriers, the law must be broad enough to include many forms of established enterprises where the transportation of the owner's property is merely incidental to the enterprise itself.

Arguments are advanced that some of these itinerant buyers have no financial responsibility nor established rules of business ethics. There have been evidences of short weights and bad checks, but these derelictions could be protected against by criminal statutes, itinerant peddler laws, inspection provisions and enforcement of existing honest weight laws without jeopardizing the private vehicle operations of established industries.

Commercial Vehicles. Barring trucks from the highways on Sundays and holidays is being pushed to the foreground despite the fact that commercial and regulated vehicles are voluntarily reducing their week-end traffic to the minimum. It is reported that railroad representatives have offered to give support to certain proposals in Missouri in exchange for assistance in securing restriction of truck operations on Sundays and holidays. Similar word comes from Illinois. Connecticut will consider special routing for trucks.

Caravaning. Legislation regulating the transportation of vehicles for sale or resale will be considered in California (where new caravaning laws may be enacted to supersede the 1937 Act that is currently enjoined). A vigorous fight will be made in Nebraska against the present restrictive statute, and similar action may develop in Wyoming. New truckaway legislation is expected in West Virginia.

Trade Regulation. Some support for legislation akin to the "Wisconsin (automobile) Dealers' Law" is developing in Washington State. Other so-called "licensing laws" are being considered in a number of states.

Sizes and Weights. When the pending investigation of the Interstate Commerce Commission has been completed and it presents its recommendations to Congress with reference to the need for Federal regulation of vehicle sizes and weights, there will be a tendency toward corrective legislation in many states in the interest of uniformity. Existing size and weight limitations are generally higher in the Pacific Coast states, and any attempt to reduce them to average standards will be resisted. A convention of state highway engineers held recently in Reno urged liberalized uniform size and weight restrictions in the eleven western states.

Efforts will be made to secure more favorable limits in Alabama, Connecticut, Florida, Maine, Minnesota, Nebraska, New Hampshire, Oregon, Tennessee and Vermont. Texas has the lowest weight limits in the country and, on the surprising thesis that such limitations are based upon safety and protection of the roads, these limits are cut in half if the load is not being transported to a railroad shipping point. Remedial legislation will be sought in Texas. Possible reductions in sizes and weights are threatened in Arizona, Georgia, Idaho and Washington.

Reciprocity

A new bill extending truck reciprocity will be offered in Idaho. There is an active and distinct threat in Michigan, sponsored by the railroads, to repeal the 1937 Reciprocity Act under which agreements were made with neighboring states to solve long-standing "border wars."

Repeal of the present reciprocity act has been urged before the Tax Commission in Nevada.

Minor amendments to the 1937 Act will be proposed in Utah. A Wisconsin Interstate Cooperation Committee will seek amendments to present Act.

Port of Entry

Legislation providing for the establishment of Ports of Entry is a constant threat in Florida, Iowa and Maine (extension for tax collection purposes). Arizona may further modify its border requirements.

In Oklahoma, there will be a fight against the present Port of Entry Law.

Highway Safety

Nineteen thirty-eight gives promise of a substantial drop in highway

(TURN TO PAGE 82, PLEASE)

"I thought Macks were only for the big fellows"

PUBLIC UTILITY: "You can't see stamina when you look at a truck, but it shows up in operation costs! . . . For years I've wished that we could 'cash in' on Mack sturdiness in a light-weight truck!"

DAIRYMAN: "With day in and day out work, we've got to figure on long run economy the same as heavy-haulers! . . . Seems like those 'big Mack' owners get all the breaks!"

PAINTER: ". . . Why don't they build a truck for our needs? I'll bet there are thousands of users of small trucks who could 'go for' a light capacity Mack!"

...but you can buy one for less than $1000

The new Macks start at 12,000 lbs. gross weight. Base prices from $985.00 for standard chassis, F.O.B. factory.*

MACK SALESMAN: *"Good news, men!* A new, light-weight line at the lowest prices in Mack history! In every detail of construction, these new Macks are worthy of the greatest name in motor trucks. And backed by 38 years' experience in building top-quality trucks exclusively! Yes, you can now buy a Mack for less than $1,000! Before you buy *any* truck at *any* price see America's most complete line of trucks—the Mack!"

MACK TRUCKS, INC., NEW YORK, N. Y.

**Includes chassis, body, and pay load*

SEE THE NEW MACKS AT THE NATIONAL MOTOR TRUCK SHOW AT NEW YORK AND THE NATIONAL AUTOMOBILE SHOWS AT NEW YORK AND CHICAGO.

for all kinds of hauling..it's a Mack

Legislative Circus

(CONTINUED FROM PAGE 80)

fatalities and accidents—thus to become the first year to break below the preceding annual record. Public opinion is thoroughly aroused to the need for stamping out this useless waste of life and property, and conscientious statesmen everywhere will be giving serious concern to this tragic subject.

Much of the proposed legislation will be laudable, but caution must be exercised to guard against two existing evils. The first is "crank" safety legislation based on emotional rather than scientific approach to the problem. Hysteria seldom provides relief, particularly when dealing with technical questions. The second evil arises from the opportunity to sabotage highway use. Laws that are vicious in purpose and method will be sponsored in the name of safety.

Accident-prone drivers, responsible for more than nine-tenths of the highway casualties, will not be removed from the road through the medium of burdensome taxes or restrictive regulations of commerce. Windshield stickers applied by border patrols provide no protection for the pedestrian. Increased drivers' license fees do not prevent collisions. Legislation should be honest in its purpose and direct in its application.

Among the specific proposals now being seriously considered are the following: Compulsory inspection of vehicles in Idaho, Oregon and California; enactment and improvement of drivers' license laws in Montana (revision), Florida, South Dakota and Wyoming; and financial responsibility laws in Idaho, Illinois and Montana.

Highway lighting has strong support in some quarters. At present, agitation appears to be especially potent along the North Atlantic Seaboard. Six bills were introduced this year in Massachusetts and have been referred to the 1939 legislature. Utility companies have been quite active in Connecticut, Maryland, New Jersey and Pennsylvania, and the subject will possibly be considered in the States of California, Oregon and Washington.

Indirect reflector buttons have been installed experimentally on important stretches of highway in Michigan and Maryland. These carefully spaced markers give the driver a definite outline of the highway ahead of him and provide a safety factor at an expense far less than that involved in highway lighting.

Grade performance ability is being studied by the Bureau of Public Roads and the Society of Automotive Engineers. Exhaustive tests are now being made by these two organizations fully cooperated in by the vehicle manufacturers of the country. Specific legislation will probably be delayed until completion of these technical studies, a year hence.

Motorists are voicing increased demands for uniformity in traffic signs and signals. Additional bills intended to expel the drunken driver will be offered. Slow-moving automobiles and trucks that impede traffic on two-lane highways are recognized as serious contributors to highway hazards.

A PARTIAL LIST OF PROBABLE 1939 LEGISLATIVE ISSUES BY STATES

ALABAMA

Repeal of present ton-mile tax.
Vote on anti-diversion amendment in November.
Fight to increase weight limit to 40,000 lb.

ARIZONA

Cities to demand share of gasoline taxes.
Itinerant vendor legislation.
Constitutional amendment against diversion.

ARKANSAS

Fight to reduce gasoline tax (last reduction passed by the legislature was vetoed).
Increase in motor vehicle taxes if bond refunding amendment carries. Matter to be considered in legislature in any event.
Regulation of private truck operators.
Itinerant vendor and rolling-stores legislation.

CALIFORNIA

Possible increase in diesel fuel tax (used in trucks) (general movement in western states).
Vote on anti-diversion amendment in November.
Municipalities demand larger share of highway funds.
Private truck operators.
New caravaning law.

COLORADO

Cities and counties demand for more highway fund sharing.
Carrier organization to fight for liberalization of carrier law. Private truck operators organizing to fight ton-mile tax.

CONNECTICUT

Gas tax for city streets.
Possible diversion.
Special routing of trucks.
Highway lighting agitation.
Possible increase in gas tax.

DELAWARE

Fight for anti-diversion amendment.

FLORIDA

Decrease in gas tax.
Repeal of ton-mile tax.
Continuing threat of port-of-entry legislation.
Fight for antidiversion amendment.
Amendment of size and weight laws.

GEORGIA

City and town demand for more highway funds.
Constant threat of weight reduction.
Beginning campaign for anti-diversion amendment.

IDAHO

Increase in truck taxes (with possible substitutes of gross weight tax).
New bill extending reciprocity.
Anti-diversion amendment.
Expansion of P. U. C. powers and revision of carrier law.
Highway department may favor weight reduction. This will be vigorously fought.
Compulsory motor vehicle inspection.
Safety responsibility act (vetoed 1937).

ILLINOIS

New carrier law proposed to include regulation of private truck operators (supposedly only for safety and financial responsibility).
Revision of Highway Traffic Act.
Weekend and holiday prohibition of trucks.

INDIANA

Restoration of 60c. per cwt. tax.
Anti-diversion amendment.

IOWA

One cent gas tax increase.
Extension of ton-mile tax.
Increase in license fees.
Port-of-entry agitation.
Itinerant vendors.

KANSAS

Further dispersion of highway revenues.
Private truck operators.
Itinerant vendor.

KENTUCKY

No 1938 regular session.

LOUISIANA

No 1938 regular session.

MAINE

Agitation for $30,000,000 bond issue for highways.
One cent gas tax increase.
Gas tax for arterial routes through cities.
Ton-mile tax bill.
Extension of port-of-entry for tax collection purposes.
Anti-diversion amendment and threat of diversion.
Increase in single unit weight limits over 24,000 lb. limit.
Highway Planning Survey.

(TURN TO PAGE 86, PLEASE)

Announcing—

The greatest line of low-priced trucks ever offered—including new *Chevrolet-built*

CAB-OVER-ENGINE MODELS

45 MODELS

On eight wheelbase lengths . . . from Sedan Delivery (on the passenger car chassis) to Heavy-Duty models with a maximum 13,500-pound gross load rating.

Let these
FEATURES OF 1939 CHEVROLET TRUCKS
be your Truck-Buying Guide

- **NEW STYLE-LEADER APPEARANCE**
  Exclusive Truck Design Throughout
- **NEW COUPE-TYPE CABS**
  Bigger—More Comfortable—Safer
- **FAMOUS VALVE-IN-HEAD TRUCK ENGINE**
  Powerful—Economical—Reliable
- **POWERFUL HYDRAULIC TRUCK BRAKES**
  Vacuum Power Brake Equipment (optional at additional cost)
- ***FOUR-SPEED TRANSMISSION**
  Rugged—Durable—Efficient

NEW 1939 CHEVROLET TRUCKS

CHEVROLET brings you the greatest truck news of the year—the most complete and advanced line of low-priced trucks in the history of modern truck transportation! Included are new Cab-Over-Engine models, *entirely* designed and *entirely* built by Chevrolet, that offer amazing new *double savings* . . . the combination of extra big load space and unexcelled Chevrolet operating economy! Whatever your truck requirements—in style, size or body type—there's a new 1939 Chevrolet truck that will haul the load or deliver the goods for less.

See these new trucks. Ask for a demonstration. Learn why they are *first* in performance; *first* in economy; *first* in long life and dependability qualities . . . and *first* in all-round truck value!

CHEVROLET MOTOR DIVISION, *General Motors Sales Corporation*, DETROIT, MICHIGAN

- **HEAVY, RIGID FRAME**
  A Foundation of Strength
- ***FULL-FLOATING REAR AXLE**
  2-Speed Axle (optional at additional cost)

*Heavy-Duty Models

On Display
NATIONAL MOTOR TRUCK SHOW
New York City
Nov. 11 to 17, 1938

"DESIGNED FOR THE LOAD CHEVROLET TRUCKS **POWERED FOR THE PULL"**

When writing to advertisers please mention Commercial Car Journal

Legislative Circus

(CONTINUED FROM PAGE 82)

MARYLAND

Decrease in gasoline taxes.
Anti-diversion amendment.
Highway lighting agitation.

MASSACHUSETTS

Serious threat of 1c. gasoline tax increase.
Continued fight against diversion (eliminated diversion this year, first time in eight years).
Dispersion of highway revenue.
Highway lighting (six bills introduced in 1938 session have been referred to 1939 legislation).
Flood relief.

MICHIGAN

Repeal of 1937 reciprocity act (sponsored by the railroads).
Vote on anti-diversion amendment in November.
Dispersion of highway revenue.

MINNESOTA

Fight against renewal of emergency gas tax.
Cities demand for more gas tax share.
Private truck operators will be subject to a tax.
Itinerant vendor.
Demand for increase in weight limits.

MISSISSIPPI

No 1938 regular session.

MISSOURI

Referendum on third cent tax added last session.
Increase in truck taxes falling chiefly on private trucks.
Citizens' Roads Association wants 20 per cent of road revenue to go to cities and 20 per cent to counties.
Center of itinerant vendor agitation.
Weekend and holiday prohibition of trucks.

MONTANA

Threat of additional gas tax postponed for the present.
Possible truck-wheel tax.
Dispersion trend.
Improvement of drivers' license law.
Safety responsibility act.

NEBRASKA

Decrease in gas tax.
Ton-mile tax.
Cities and towns demand for more highway revenues.
Private truck operators.
Fight against caravan law by automobile dealers association.
Fight for more favorable weight limits.

NEVADA

Difficulty over reciprocity.
Anti-diversion amendment.
Itinerant vendors.

NEW HAMPSHIRE

One cent gas tax increase (to relieve real estate taxes and possibly to pay for flood damage).
Vote on anti-diversion amendment in November.
Highway Planning Survey.

NEW JERSEY

Threat of gas tax increase, but strong opposition.
Anti-diversion amendment.
Passage of carrier regulation.
Highway lighting agitation.

NEW MEXICO

Cities demand more highway revenue share.
Itinerant vendor legislation.

NEW YORK

Fight against renewal of emergency gas taxes.
Anti-diversion fight.

NORTH CAROLINA

Anti-diversion amendment campaign to be continued.

NORTH DAKOTA

One cent gas tax increase.
Itinerant vendors.

OHIO

Fight for reduction of gas taxes.

OKLAHOMA

Fight against ton-mile taxes and port-of-entry law.
Fight flat-fee basis for trucks and cars.
Initiative petition for return of nearly half of highway revenue to local units.
Itinerant vendors.

OREGON

Possible increase in truck taxes.
Municipal tax on trucks. Possible property tax on vehicles.
Anti-diversion constitutional amendment.
Cities and counties agitation for more highway revenue.
Strong demand for increase in weights (in line with those of surrounding states).
Compulsory motor vehicle inspection.
Highway lighting.

PENNSYLVANIA

Possible tax increase (because of need for additional relief funds). At the same time, there will be a concerted effort to *reduce* the gasoline tax.
Anti-diversion constitutional amendment.
Highway lighting agitation.

RHODE ISLAND

Anti-diversion amendment.
Increase in gas tax.

SOUTH CAROLINA

Threatened repeal of favorable 1938 "Truck" Law, which liberalized sizes and weights.
Increased share of gas tax for counties.

SOUTH DAKOTA

Anti-diversion constitutional amendment.
Itinerant vendors.

TENNESSEE

Reduction of gas tax and repeal of ton-mile taxes.
More favorable size and weight limitations.

TEXAS

Fight for improvement of status of private truck operators.
Itinerant vendors.
Fight for modification of weight laws.

UTAH

Increase in gas tax if farm refund program carries.
Few minor changes in 1937 reciprocity act.
Growing demand by municipalities for more highway funds.
Agitation for revision of carrier law.
Constitutional amendment against diversion.

VERMONT

Threat of diversion and dispersion.
Liberalization of weight limits.
Highway Planning Survey.

VIRGINIA

No 1938 regular session.

WASHINGTON

Increase in gas tax (for county roads). Increase vetoed in 1937.
Oil inspection bill for revenue.
Cities to seek 15 per cent gas tax revenues.
Possible threat to private carriers.
Extension of P. S. C. authority.
Possible support for Wisconsin automobile dealers' law.
Some agitation for reduction in size and weight.
Some agitation for highway lighting.

WEST VIRGINIA

Fight against renewal of 1c. gas tax.
Amendment and extension of carrier law.
Regulation of truckaway companies.

WISCONSIN

Possible increase in gas tax.
Amendments to present act to be sought by Interstate Cooperation Committee.
Cities demand more highway funds.

WYOMING

Demand more liberal allocations to cities.

SAE Annual Dinner

The SAE Annual Dinner will be held this year on Nov. 14 at the Commodore Hotel, New York.

H. W. Prentis, Jr., president of Armstrong Cork Co., and Grover Whalen, president of New York World's Fair, Inc., are dinner speakers to be introduced by Toastmaster B. C. Forbes, leading business commentator. Paul Whiteman's orchestra has been selected to provide music and entertainment.

NAPA Ford Manual

A 105-page volume, containing complete service information for mechanics on all 1937-38 models of Ford V-8, Chevrolet and Plymouth cars has just been announced by the National Automotive Parts Assn., 705 Fox Building, Detroit. The manual may be obtained through NAPA warehouses and jobbers. Price is $1.25.

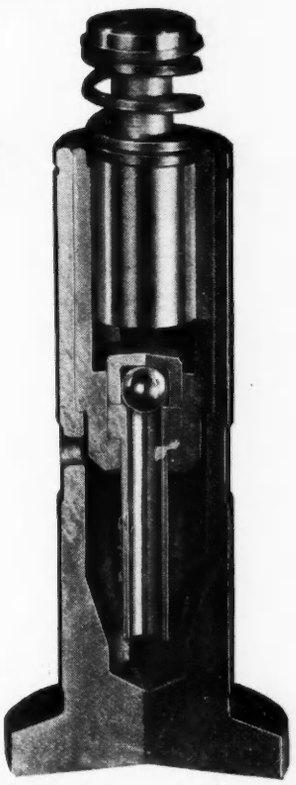
Salesman in the House?

The manufacturer of an advertised tire tool is seeking salesmen to sell fleets and if possible car dealers and gasoline service stations. Remuneration is by commission and bonus. If you are interested drop a card to The Editor, COMMERCIAL CAR JOURNAL, Philadelphia, Pa.

The
1939 WHITE TRUCKS*
are
ZERO-LASH
Equipped

ZERO-LASH HYDRAULIC VALVE LIFTERS

Give White Truck Engines These Important Performance Advantages



1. Improved Engine Performance
2. Simplified Engine Design
3. Freedom From Tappet Adjustment
4. Valve Gear Quietness
5. Accurate Valve Timing
6. Prolonged Life of Valve and Seat

Complete information about Zero-Lash Hydraulic Valve Lifters will be gladly furnished upon request.

* *Engine Models 20-A, 24-A, 30-A*

WILCOX-RICH *Division of Eaton Mfg. Co.* **DETROIT**

MACK'S THERMODYNE

(CONTINUED FROM PAGE 55)

both the crankshaft and the camshaft. Pistons are long and fitted with five rings. Connecting rods are precision machined to secure uniform weight distribution. Crankpins are 3 in. in diameter. Cylinder heads are of generous depth, and are cast in two blocks of three. Each is secured by 20 hold-down studs. The crankshaft is provided with 12 integral counterweights and with 3½-in. main journals. For stiffness, the shaft is made short and stubby at both the front and rear ends and all fillets are of large radius. Crankpins are hollow. This reduces centrifugal forces acting on the bearings and assists in cooling the shaft and bearings. To pass the drilled oil passages around the bored-out crankpins, they are drilled on a skew, thus obviating inserted pipes, and due to the tangential openings in both the main and crankpin surfaces, centrifugal forces are reduced and the oil is delivered to the connecting rod bearing at a wiping angle.

Owing to the size of the crankpins, a conventional connecting rod could not be passed through the cylinder bores for removal. Accordingly, the big-end cap of the rod is split at an angle of 35 deg. With the diagonal split, not only has the possible crankpin diameter been increased, but the support for the connecting rod bearing has been stiffened. The substitution of capscrews threaded directly into the rod bosses instead of bolt or stud construction has permitted this fastening to be made with greater accuracy and security, although with lighter weight. In addition tongue-and-groove joints are provided on the two faces so that the cap is positively locked to the rod. Thus the bearing cannot spread at the parting and the retaining screws are subjected to no resulting shear. Heat-treated chrome-molybdenum steel forgings are used for both rods and caps.

Wristpins are 1 7/16 in. in diameter, and, being full-floating, nearly their entire surface is available as bearing area. They are retained in the piston by aluminum plugs with spherical heads, ground to the radius of the cylinder bore. Being soft these cannot wear the cylinder bore. They are provided with three oil holes on their spherical heads where oil is picked up from the cylinder walls and fed to the wristpins.

Pistons are of the T-slot, cam-ground pattern, cast of aluminum alloy, with five rings. Of these, three are compression rings of ⅛ in. face and two are oil-control rings of 3/16 in. face.

Precision shell-type steel-backed and babbit-faced shimless bearings are used for both main and connecting rods. Main bearing caps are of drop-forged steel and of the trussed type to secure the maximum stiffness.

Overhead valves are actuated by tubular push-rods from mushroom tappets, and rocker-arms of exceptional stiffness. Double concentric springs are used on the valves, inclosed in guide cups. Exhaust valves are of Stabl-ite type with austenitic heads welded to chrome-nickel stems. They have 30 deg. face angle and seat in inserts of Niferrite, faced with Stellite. Intake valves are of the

(TURN TO PAGE 94, PLEASE)

● "We've performed a major operation; we've cut out the CAUSE of most speeding, which is: "trying to make up for lost time."

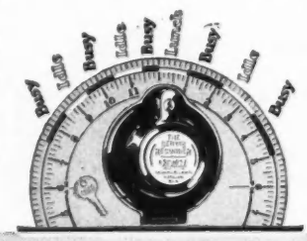
Speeding Gains Nothing

Where there's a *Servis Recorder* on the truck, that truck doesn't have "lost time." Or if it does, that lost time *shows up* on the chart and no amount of speeding will make it up!

That's something which even the Insurance Companies now recognize. Ask for Insurance Testimony and complete facts today.

Prevention* beats *Cure

Over 100,000 trucks now equipped with the *Servis Recorder.* These are the trucks that have the best records on accidents, year after year.



THE SERVICE RECORDER CO.
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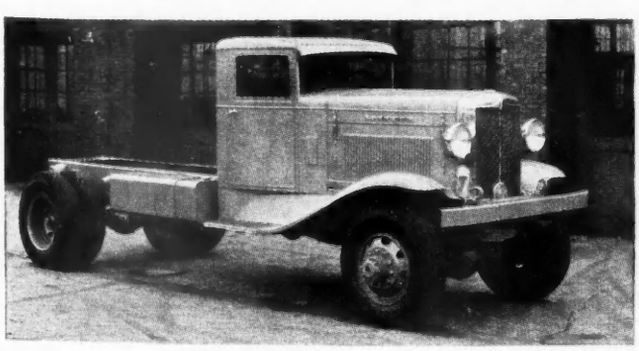
The Servis Recorder
Tells Every Move Your Truck Makes

• Loaded to the top boards, up grades impossible for an ordinary truck, through soft sand, dirt and snow—Marmon-Herrington *All-Wheel-Drive* Trucks made old timers stare in amazement, in 1938.

But they haven't seen *anything* yet!

Just wait till they see what these *new* 1939 Marmon-Herringtons will do—*with power and traction on all wheels.* Man, we've got something here—got something *you* need, if your trucks have to get off hard ground or pavements, and go places, with heavy loads, regardless of what's under foot!

It takes traction—all-wheel-traction—to pull a heavy load of oil rig equipment, or logs, or crushed stone or gravel out across desert or plain, through gulley and stream. It takes *traction,* to go down into excavations, pits and quarries and bring out the kind of loads that cut days off operating schedules. It takes traction—*all-wheel-traction*—to buck and break shoulder deep drifts on snow bound highways.



Yes, it takes traction—but it takes *speed and maneuverability* too, if you want to get the job done on time—and save money in doing it. And you get all three—tremendous traction, high speed and incomparable ease of handling—plus positive dependability and economy—in a Marmon-Herrington *All-Wheel-Drive* Ford.

Marmon-Herrington converts all Ford truck, commercial and passenger car models to all-wheel-drive—and in addition, builds a complete line of extra heavy duty models with load capacities up to 25 tons. Ask for literature.

SEE THEM AT THE
5th ANNUAL MOTOR TRUCK SHOW
New York City **Exhibit Space No. 38**

MARMON-HERRINGTON COMPANY, INC., Factory and General Office, INDIANAPOLIS, INDIANA, U. S. A.

MARMON-HERRINGTON *All-Wheel-Drive* FOR 1939

When writing to advertisers please mention Commercial Car Journal

(CONTINUED FROM PAGE 92)

chrome-nickel type, with 30-deg. seats directly in the block.

All oil passages throughout the engine are rifle-drilled in the cylinder block, crankcase, heads or shafts. The gear type oil pump of 8 gal. per minute capacity is located at the middle of the engine, toward the right side. The rocker shafts are hollow and from the rocker-arm bearings the oil is conducted through holes drilled in the rocker-arms to lubricate the valve stems and valve spring guides. The oil filter is built on to the engine.

Crankcase ventilation is through the push-rod openings to the rocker-arm covers, from the tops of which aluminum fittings are connected with the oil-bath type air filter.

The intake manifold is in three parts, the lower and central portion being of T-form, having an exhaust-jacketed riser from the updraft carburetor. Like the intake manifold, the exhaust is in three parts. The joints are of the telescopic type and are ground to fit, so that a perfectly gas-tight, yet free-sliding joint is secured without packing. Both manifolds are of the six-port type.

Just below the manifolds is an asbestos shield to protect the ignition apparatus and fuel pump. Of the centrifugal type, the governor is driven directly by gears from the auxiliary shaft and connects by a short, sealed rod and tube with the governor throttle.

Water from the 120-gal.-per-min. pump is introduced in a water header in the block and extending the full length of the engine. Graduated openings from this header admit the water to the heads, adjacent to the exhaust valve seats. From thence the water escapes through an outside water header along the left side of the cylinder heads. Cylinder jackets extend down to the top of the crankcase.

The water pump is of conventional design. The rotor is cast of bronze. It is provided with an automatic seal. The pump shaft, which also serves as the fan shaft, is of nitrided steel, hard and stainless. It runs on two reservoir-lubricated ball bearings.

For shops that demand the best equipment . . .

1.34 to 45 cu. ft. per min.
40 to 200 lb. pressure
¼ to 10 horsepower

TO DELIVER plenty of air power for many important functions of the modern shop . . . for lifts, tire pumps, pneumatic tools, painting equipment . . . and to deliver such power *economically*.

This is just another way of specifying Worthington Air Compressor Units. There is a complete range of sizes for the needs of any shop.

With Worthington's wide distribution and service set-up, you can buy ***real machinery*** and ***protected profits.***

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WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: HARRISON, NEW JERSEY • *Branch Offices and Representatives in Principal Cities throughout the World*

AUG-2

WAUKESHA

(CONTINUED FROM PAGE 56)

is 8 gal. The Model 6WALH has a 5¾ in. bore and a 6½ in. stroke.

Ignition is by fixed spark produced by a heavy duty magneto. There is no ground connection. The engine is stopped by cut off of the fuel feed. The fuel pump is a single unit with six plungers with special Hesselman nozzles and drawn steel high pressure lines. The governor is a built-in, centrifugal self-lubricated device driven by the timing gears. Two 12-volt starters are used.

HERCULES

(CONTINUED FROM PAGE 53)

and a 5¼ in. stroke. Both are six-cylinder engines. The RXLC produces 135 hp. at 2200 r.p.m. and the RXLD 142 hp. at the same speed. Torque for the RXLC is 385 lb. ft. at 900 r.p.m. and 405 lb. ft. for the RXLD.

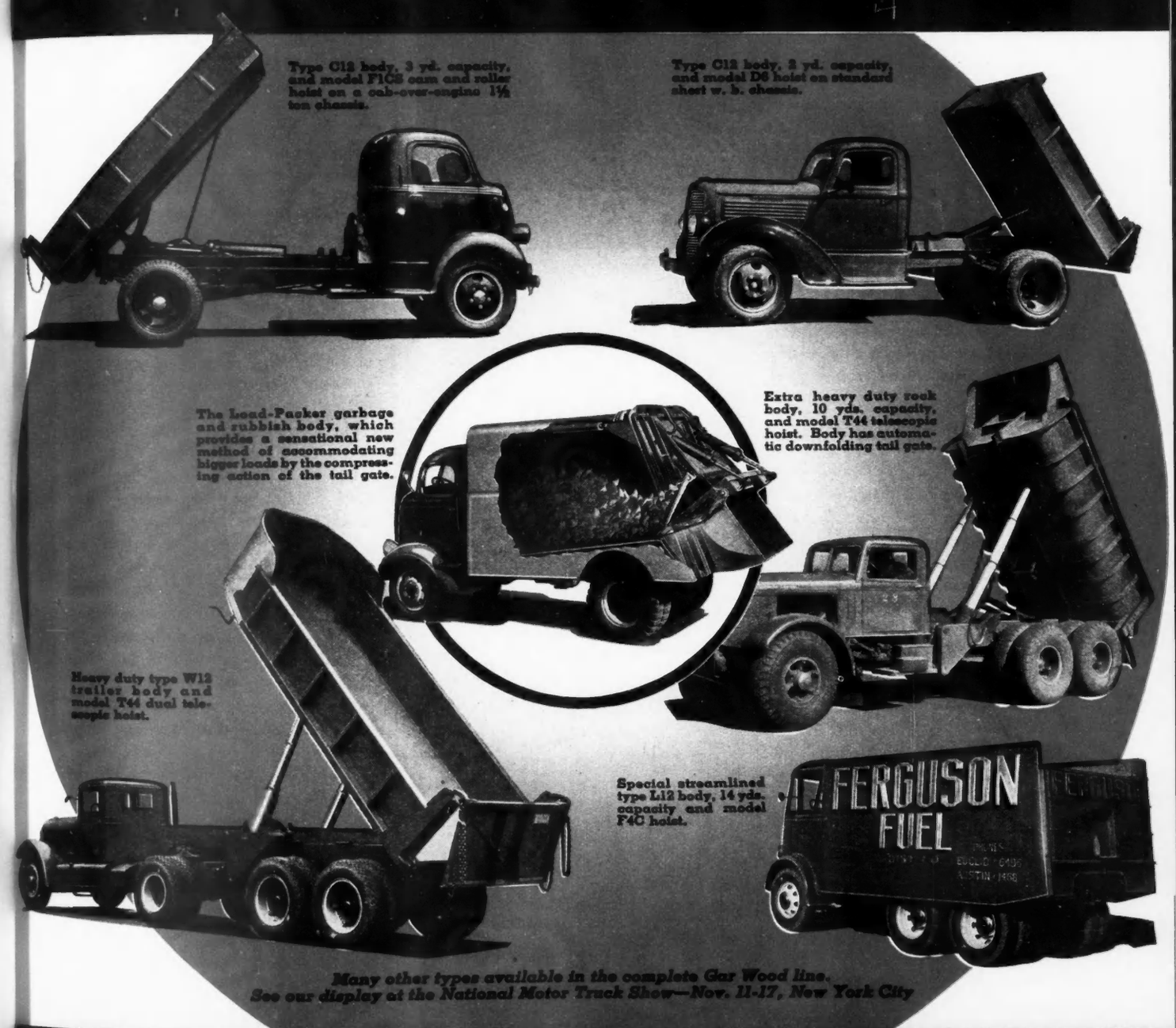
Both engines are L-head in design, using alloy pistons. Both have seven 3½-in. main bearings and 3-in. connecting rod journals. Four compression rings and one oil ring are used on each piston.

Equip your new chassis with

GAR WOOD

Hoists and Dump Bodies

Recognized by the trade as the leader in design, high grade workmanship and long life


Type C12 body, 3 yd. capacity, and model F1CS cam and roller hoist on a cab-over-engine 1½ ton chassis.
Type C12 body, 3 yd. capacity, and model D6 hoist on standard short w. b. chassis.
The Load-Packer garbage and rubbish body, which provides a sensational new method of accommodating bigger loads by the compressing action of the tail gate.
Extra heavy duty rock body, 10 yds. capacity, and model T44 telescopic hoist. Body has automatic downfolding tail gate.
Heavy duty type W12 trailer body and model T44 dual telescopic hoist.
Special streamlined type L12 body, 14 yds. capacity and model F4C hoist.
FERGUSON
FUEL

Many other types available in the complete Gar Wood line.
See our display at the National Motor Truck Show—Nov. 11-17, New York City

GAR WOOD INDUSTRIES, INC., DETROIT

WORLD'S LARGEST MANUFACTURER OF TRUCK EQUIPMENT—Hoists, Bodies, Fuel Oil and Gasoline Tanks, Winches and Cranes, also Carpullers, Trailbuilders, Bulldozers, Rippers and Hydraulic Scrapers.

GENERAL MOTORS

(CONTINUED FROM PAGE 42)

the increased power to be found in the 1939 line is found in the new 248 engine designed for the new 400 series. With less than 4 per cent displacement increase over the 239 engine, the "248" develops 21 lb. ft. more torque. In fact, with 9 cu. in. less displacement than the former 257 engine, the "248" actually develops 6 lb. ft. more torque.

Both increased power and greater economy are achieved by new combustion chamber design. Domed pistons and a high-compression cylinder-head contour create high fuel turbulence with the maximum chamber volume near the point of ignition. The sides and top of the chamber converge from this point, reducing the volume at the extreme end of burning. This assures even burning and prevents detonation.

Crankshafts on the 278 engine and larger have 7 bearings. Bearing areas on these engines have been increased 68 per cent and all main and connecting-rod bearings are of the interchangeable precision type.

A cooling system, with full-length water jackets and directed cooling to the hottest spots in the engine, is another feature. Exhaust valve seats, passages, and valve guides receive individual cooling from water forced through thimbles in the cylinder block. On the larger engines a water distributing pipe inside the cylinder water jacket insures uniform cooling the entire length of the block.

The new engines have pressure lubrication. The oil pump capacity has been increased to maintain full pressure on the larger bearing areas. Crankshaft journals are cross-drilled, forcing oil into piston-pin bearings twice every revolution. An automatic regulating valve supplies an ample and uniform amount of oil under pressure to all valve rocker arms. On the larger engines all oil pipes are replaced by drilled passages. Oil filters are bolted direct to the case.

Syncro-Mesh Transmissions

New heavy-duty, five-speed syncromesh transmissions are standard equipment on models AC-700 and up. Applied to heavy-duty truck transmissions for the first time, the syncromesh principle also is applied to five-speed transmissions with silent helical gears in all speeds except low and reverse. Both underdrive and overdrive are available.

Double clutching is a thing of the past with this new syncromesh transmission, which shifts just like a passenger car. After the truck has been set in motion in low gear, shifting to higher speeds is instantaneous through synchronizing cones which either speed up or slow down the clutch disc. This engages the gears at the same speed, easily and quietly.

Syncromesh is available at slight extra cost as far down the line as the AC-500.

The 1939 line consists of 14 conventional models, 11 cab-over-engine models and the Special Delivery. Gross vehicle weights have been increased from 1000 to 2000 lbs. on all models, starting with the AC-300, up to and including the AC-550. These same gross vehicle weight increases apply to corresponding cab-over-engine models.

GMC's new Special Delivery offers

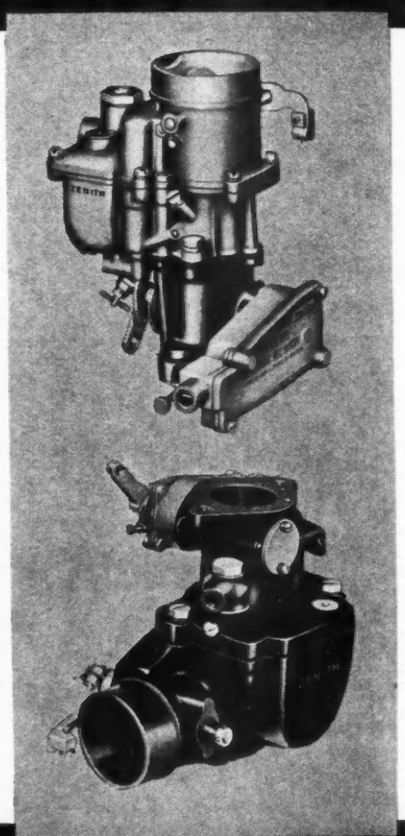
(TURN TO PAGE 102, PLEASE)

Announcing the New

ZENITH

Combination

CARBURETOR AND GOVERNOR



Zenith, first with so many important advancements in carburetion, now pioneers with a perfectly matched and balanced combination Carburetor and Governor!

It overcomes all previous drawbacks of separate carburetor and governor installations. It is cheat-proof; fuel-flow and manifold distribution are maintained at full Zenith efficiency; governing action is smooth and clear-cut; there is no surging; there is but one throttle shaft, operating on ball bearings—hence operation is positive, uniform, steady, under all conditions of road and load; acceleration is instant, unlagging.

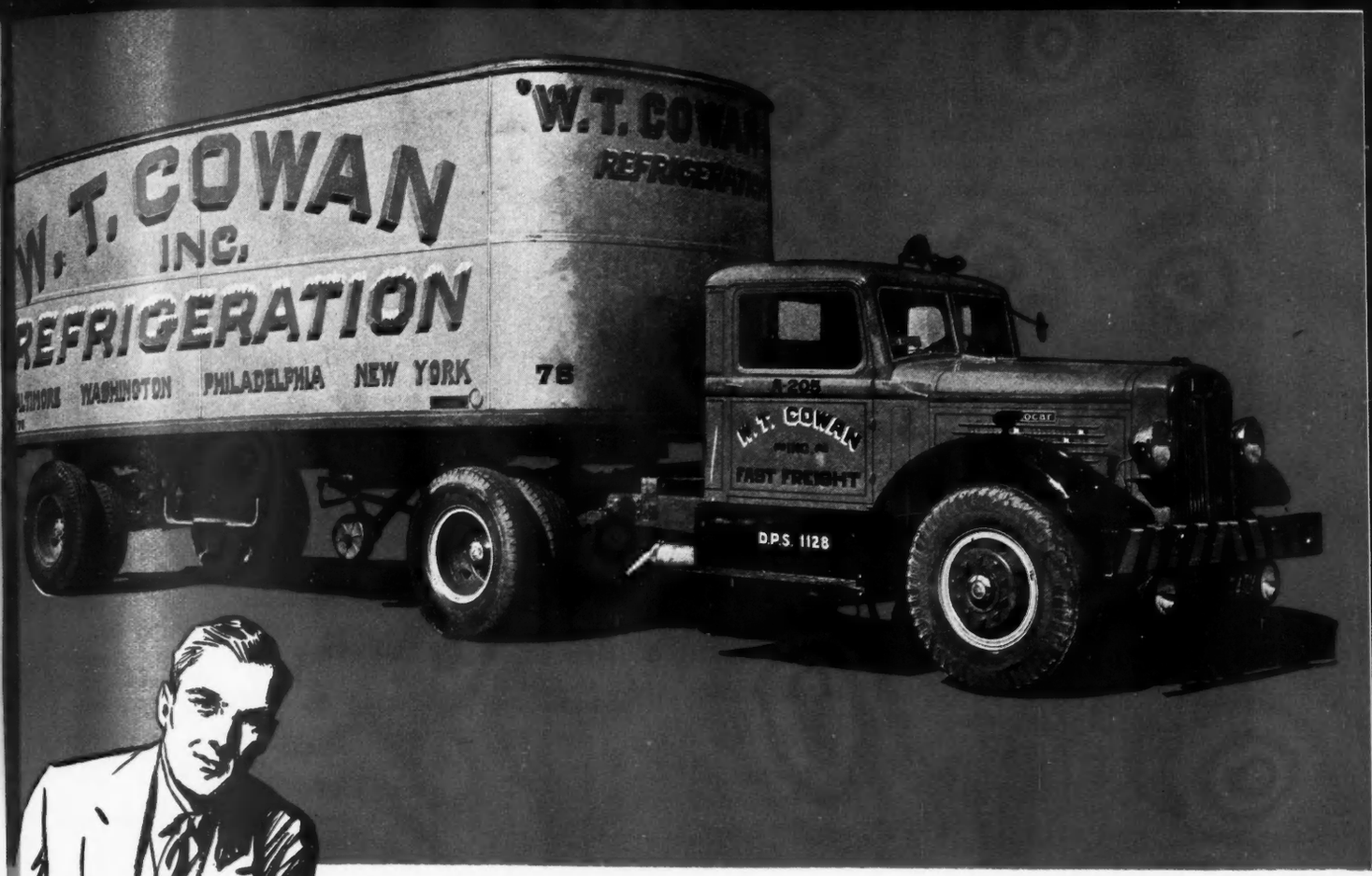
Available in both downdraft and updraft types to fit most popular engines.

for Trucks, Buses, Delivery Units and Car Fleets

Consult your Zenith Distributor or Dealer, or write—

ZENITH CARBURETOR DIVISION

Bendix Aviation Corporation • Detroit, Michigan



"WE ARE AVERAGING APPROXIMATELY 70,000 MILES ON THE REAR BRAKES OF OUR TRACTOR UNITS..."

LeRoy Harris—Operating Mgr.
W. T. COWAN, INC.

Operating out of Baltimore, Md., W. T. Cowan, Inc., provides fast motor freight service between Washington, Baltimore, Philadelphia, New York City and Binghamton, N. Y. There couldn't be a better brake testing laboratory than such a route. It covers everything from the world's heaviest traffic to grades and curves that would kill any schedule if the finest equipment were not used.

That's why we are particularly proud of Thermoid's record with Cowan.

The statement that they are averaging 70,000 miles on the rear brakes of their tractor units with Thermoid Brake Lining is the clearest kind of evidence of Thermoid's performance and economy.

Regardless of the type of unit you operate . . . regardless of the route conditions your units face, you'll find that there's a Thermoid Lining with the *right friction* for every braking job. You, too, can increase the mileage you get from brake lining by insisting that your jobber supply you with Thermoid.

Thermoid

CUSTOM-BUILT BRAKE LINING SETS

CUSTOM BRAKE BLOCK SETS THERMO-BLOCKS FOR HEAVIEST DUTY

THERMOID COMPANY, TRENTON, N. J. *In Canada*, THERMOID, LTD., TORONTO

(CONTINUED FROM PAGE 98)

a load capacity almost double that of a conventional panel body with the same wheelbase. (See Sept. issue C.C.J., page 35, for details.)

Throughout the line particular attention has been paid to the comfort of the driver. A new, modern, low-priced cab, roomier in all dimensions—length, width and height is introduced. This new cab provides more entrance space and greater leg room. It has a V-type windshield which is hinged at the top for ventilation. Reduced front pillar width minimizes blind spots.

The cab interior is finished in a new gun-metal gray crinkle finish with upholstery matching. Both seat and back are adjustable and the contour has been altered for greater comfort. Rubberized hair pads now are standard equipment in the improved seat cushion construction.

Features of the heavy-duty cabs used on models AC-500 and above, include improved seat construction with rubberized pads, encased window glass mounting, non-shatterable glass, gun-metal gray interior finish, and an improved three-point mounting designed to maintain hood fit and clearance between radiator and fan. Cabs for cab-over-engine models have these same features, except the mounting is four-point COE type.

Improved riding features of the half-ton and three-quarter-ton models include more flexible springs, front and rear shock absorbers as standard equipment, a materially strengthened front-end structure of the frame, and heavier front cross members. Improvements are the new channel bumper design and attachment, increased flange widths, heavier frame sections, increased frame depth.

All the new cab-comfort features are incorporated in the new panel bodies. Because of a wider body, greater length at the upper rear corners, and a higher rear door, the new panel bodies provide a greater actual load capacity than ever before.

Increased width of pickup bodies makes possible the handling of material measuring a full 4 ft.; a pressed-steel corrugated floor and a rugged all-steel body provides longer life for this type of vehicle.

Included is a new Suburban body for the short wheelbase half-ton chassis, featuring improved appearance and greater driver comfort. To meet the requirements of a majority of users, a newly designed drop tail gate replaces the panel-body-type rear doors.

A new rear axle with 1⅞ in. shafts is added to correspond with the increased capacity of the 450 and 500 series. Dual performance rear axles are continued throughout the same range of models as in 1938.

Hand brakes on the 700, 800 and 850 series are new. Two short shoes engage inside and outside of the cast drum simultaneously and due to their servo-action require comparatively little force on the lever to make a smooth stop. Since a greater part of the drum is exposed to cool air, lining life is prolonged.

New for 1939, and exclusive with GMC on all conventional models, AC-600 and up, and on all COE models AF-500 and up, is the ball-bearing steering.

Through this feature, heavy-duty trucks, even when loaded to capacity, can be handled with virtually passenger-car ease. The steering gear

(TURN TO PAGE 106, PLEASE)

SIMMONS

Silver King HYDRAULIC JACKS

"Give you the lift you need"

STURDY and ECONOMICAL

You don't pay premium prices for Silver King Jacks, but you do get extra dividends on your investment—better service, less maintenance, long continued usefulness.

Rugged one-piece malleable body, built-in ball check and pump unit eliminate leaks and give unusual strength. Pressure cylinder anchored top and bottom, plus the Simmons method of piloting the ram, gives rigid support even when ram is fully extended.

Standardizing your jack equipment with Silver Kings is sensible economy

for BUSSES, TRUCKS, PASSENGER CARS and INDUSTRIAL USES. Capacities from 1½ to 30 TONS

The preference of maintenance men for Silver Kings is based on experience. When there is lifting to be done Silver Kings are always ready.

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IT DON'T BOTHER ME ANY MORE, TOM, SINCE THEY RELINED THESE BRAKES WITH RAYBESTOS!
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OWNERS ***watch maintenance cost sheets and repair bills.***

Raybestos heavy-duty linings give the maximum combination of the *performance* desired by drivers and the *economy* sought by owners.

A specific combination of Raybestos materials is developed for every type of brake and service. Records of performance are scientifically established by the Raybestos Test Fleet, which operates several hundred thousand miles each year under all driving conditions.

Put this Raybestos experience to work for *your* fleet, without cost or obligation. Call in a Raybestos field engineer through your nearest Raybestos distributor, or write direct to:

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Raybestos HEAVY DUTY BRAKE LINING

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(CONTINUED FROM PAGE 102)

action is basically the same type as used in the past, simply described as a nut traveling up and down a screw thread. In the new design, steel balls are inserted between the threads, which changes the sliding motion to a rolling motion. Due to the very high efficiency of this type gear, steering gear ratios are lessened, thus steering is not only faster and safer, but the driver's steering effort is reduced 50 per cent.

The 1939 GMC line of ten diesel models includes five conventional and five COE models specially designed for the medium and heavy-duty truck market, powered with the new General Motors diesel engines. These engines, both smaller and lighter than conventional four-cycle diesels of comparable power output, are two-cycle diesels, offering twice as many power strokes per revolution as the conventional four-cycle engine. (Full description of these engines appeared in March issue of C.C.J.)

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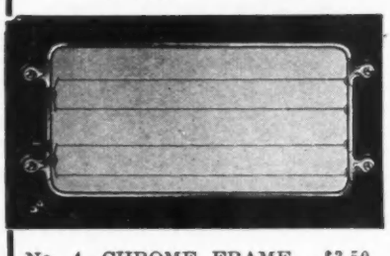

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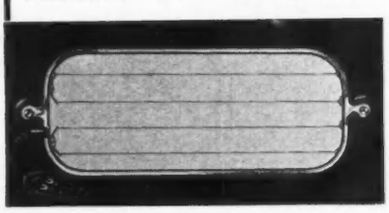

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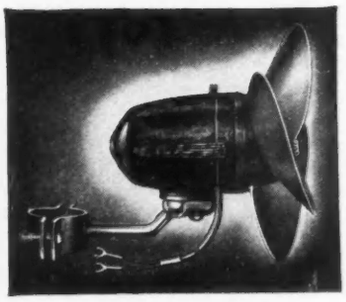

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Make your fleet a 100% Safety Fleet this winter. Equip every truck, bus or passenger car with CASCO Electric Defrosters. In unheated cabs they are the only *positive* method for removing *Sleet* at all temperatures and under all conditions. Clear vision is assured during bad storms. Driving is made safer—accidents due to poor vision reduced or prevented.

The cost of these Defrosters is small compared with the time saved in driving schedules and relieved strain on your drivers.

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with powerful, efficient new motor, full 6" rubber blades and two-speed switch. Installed on steering column or header board. Keeps *inside* of windshield clear in unheated closed cabs.

Acts as defrosting device in well heated cabs. A safety device which is in universal use. Made with 6-volt motor at $4.15 List, or 12-volt motor at $4.65 List.

See your nearest wholesale house for estimate on complete equipment of these Casco Safety Necessities. Do it now. Be prepared.

CASCO PRODUCTS CORP., BRIDGEPORT, CONN.

Also Casco illuminated Switches for Defrosters and Hot Water Heaters, Speed Warning Indicators, Fender Guides, Cigar Lighters, Grille Guards, etc.

FEDERAL

(CONTINUED FROM PAGE 41)

gine models, features the striking streamlined front end styling. Cab-over-engine models are truly functional in their design and also have distinctive grille ornamentation as their identifying feature.

Trucks of the smaller sizes, in conventional and cab-over-engine types, from ¾ to 5-ton capacity, are all powered with 6-cylinder Hercules engines. All of these engines have 2½-in., 7-bearing crankshafts with "Tocco" electrically hardened bearing surfaces, removable cadmium bearings, full-length water jackets, gear-driven water pumps and silent helical timing gears.

Fish-belly type frames are used in all of these models. The models in this group are all equipped with 4-speed transmissions, except those carrying a 3-4½ ton and 3-5 ton rating, which have 5-speed transmissions. All have Timken front axles and Timken full floating, bevel drive rear axles. Lockheed 4-wheel hydraulic brakes are employed throughout with vacuum boosters standard on all models except those rated 1½ ton and under. Other features on this group of models include roller bearing universal joints, fore-shackled front springs, rubber-bushed shackles, cast-steel wheels. Two-speed rear axles are optional equipment.

Timken rear end units are used on all Federal 6-wheelers, both single and dual drive.

Cabs in standard type with one-piece windshield and deluxe type with V-windshield are especially designed to harmonize with chassis lines. Improved comfort and safety factors have been incorporated for 1939. Two-tone color combinations carried out in the cabs and instrument panels give the interiors an exceptionally attractive appearance. All cabs have been thoroughly insulated and sealed against outside temperature, gas fumes and dust. Controls and instruments are grouped for easy reading and accessibility on the handsome chrome-trimmed instrument panel. On the right side of the panel is a large dash compartment.

Complete specifications of new Federal models are published on page 46

STERLING

(CONTINUED FROM PAGE 40)

flexible three-point mounting. Great rigidity is added to the cab by the one-piece steel roof, which is insulated against heat and cold.

Maximum visibility is provided by the two-piece, V-type windshield, narrow corner posts, and wide door windows. Reflections are reduced because of the sloping windshield, and sun glare is avoided through the use of an adjustable visor. Shatterproof glass is used throughout.

Three men can ride comfortably in the Sterling deluxe cab. The soft, deep seat cushions and lazyback, which can be easily adjusted to suit the driver, are of sponge rubber, upholstered in genuine leather. The cab is fully equipped with document pockets, door locks, rear-view mirror, coat hooks, dome light, dual cowl ventilators, floor dimmer switch, and two automatic windshield wipers.

The new models also feature woodlined frames and bolted construction. The woodlined frame is advantageous because of its greater shock-absorbing qualities.

The gross ratings range from 18,000 to 80,000 lb. A wide range of models is available with final drives of either bevel gear, double reduction, or chain. In addition to four-wheel chassis, there are six-wheel chassis of either the two or four rear wheel drive type. Diesel engines are furnished as standard in both four- and six-wheel chassis.

In addition to the conventional types an improved line of cab-over-engine models is available. These are furnished with either bevel gear, double reduction, or chain drive, four or six wheels, gasoline or Diesel powered, ranging in capacity from 18,000 to 60,000 lb. gross.

An outstanding feature of the cab-over-engine models is the forward-tilting cab which permits easy access to the engine and its accessories. The cab can be tilted in less than a half minute and returned to position in 15 seconds.

The cab is smart in appearance, roomy, and exceptionally comfortable. The hood, engine housing, and floor boards are insulated with 1-in. asbestocell. Large sloping "V" type windshields permit of maximum vision. Adequate ventilation is provided for by adjustable windshields, door windows, and the windows in the rear of the cab. Heat from the engine is exhausted through an aperture in rear of cab.

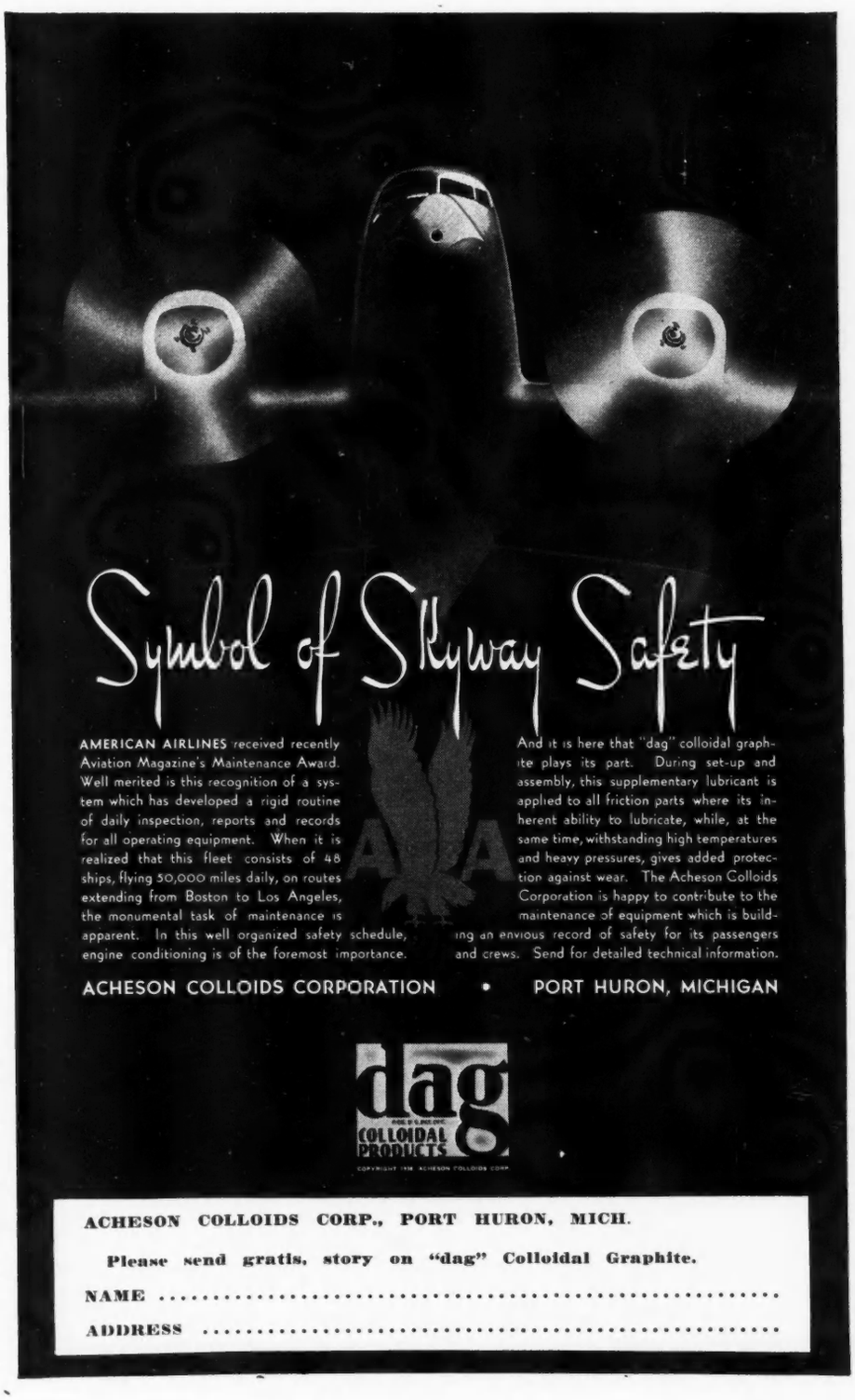
Entry to and departure from the cab can be made with ease. The gear shift and hand brake levers are conveniently located. On all models transmission gears are shifted and the parking brake is operated by remote control. All instruments are clearly visible to the driver and include selector type oil gage and fuel gage in addition to usual instruments.

Federal Expands Dealer Set-up

The aggressive dealer expansion program conducted by the Federal Motor Truck Co. during the first nine months of 1938 has produced a 40 per cent increase in total dealer outlets since Jan. 1.

U. S. Truck Awards Drivers

Carl W. Behrens, president of the U. S. Truck Co., Inc., Detroit, recently handed out checks for $4,000 made out to individual drivers who have during the past year driven without an accident. Mr. Behrens ordered the bonuses paid notwithstanding the decrease in revenue during the last 10 months.


Symbol of Skyway Safety
AMERICAN AIRLINES received recently Aviation Magazine's Maintenance Award. Well merited is this recognition of a system which has developed a rigid routine of daily inspection, reports and records for all operating equipment. When it is realized that this fleet consists of 48 ships, flying 50,000 miles daily, on routes extending from Boston to Los Angeles, the monumental task of maintenance is apparent. In this well organized safety schedule, engine conditioning is of the foremost importance.
And it is here that "dag" colloidal graphite plays its part. During set-up and assembly, this supplementary lubricant is applied to all friction parts where its inherent ability to lubricate, while, at the same time, withstanding high temperatures and heavy pressures, gives added protection against wear. The Acheson Colloids Corporation is happy to contribute to the maintenance of equipment which is building an envious record of safety for its passengers and crews. Send for detailed technical information.
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ENGINE
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(CONTINUED FROM PAGE 57)

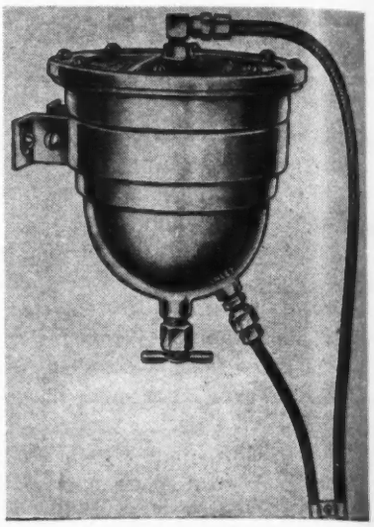
pacity up to 20 gal. per hour. Full particulars and prices are ready for the asking. Address S. F. Bowser & Co., Inc., Fort Wayne, Ind.

Permanent Oilfilt'eer

A new oil filter of permanent design has been introduced under the name Permanent Oilfilt'eer. Its aluminum die cast housing contains four brass wire meshes of No. 40, No. 50, No 60 and No. 80 grades spaced at equal intervals within the filter. There is no other filtering medium, a space being provided ahead of each mesh to accumulate sludge and foreign matter. At specified intervals the entire device may be disassembled and cleaned. There is nothing to wear, nothing to replace. For complete details, write Motor Master Products Corp., 4757 Ravenswood Ave., Chicago.

Car-Life Oil Cleaner

A new type oil filter that cleans by separation rather than filtration has been Compton Car-Life Co. A dirt trap is said to separate heavy dirt, water and metal



abrasives before filtration starts. Beyond the trap oil is gently forced through a large separator cartridge which filters out remaining impurities.

Every time the engine stops a backwash of oil occurs forcing dirt into the trap. This may be removed by opening a pet cock while the engine is running. Oil pressure forces the dirt out. Extensive tests have shown the filter gives unusually long cartridge life said to result mainly from the efficiency of the trap. There is a new bulletin giving complete details. Write Compton Car-Life Co., 212 McAdam St., Oakland, Calif.

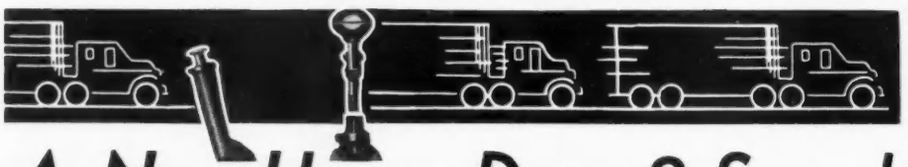
DODGE

(CONTINUED FROM PAGE 37)

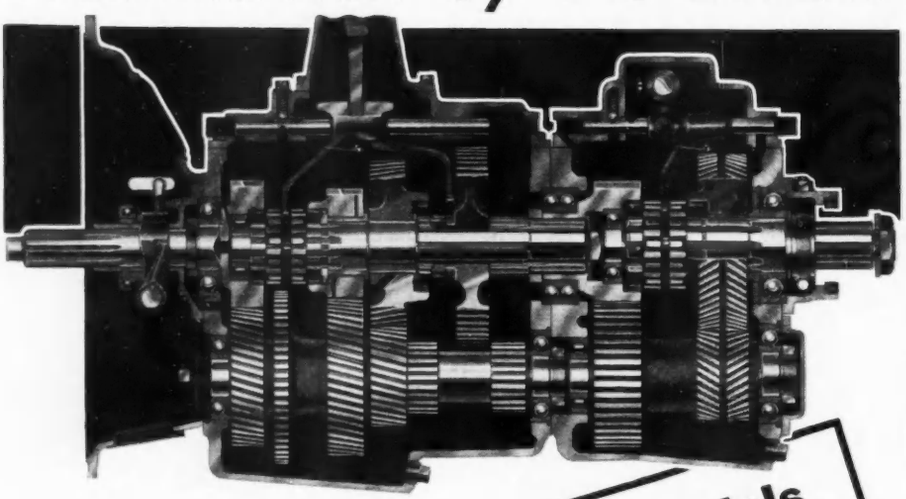
body types in the ¾-ton series which is available only in 120-in. wheelbase. Maximum gross rating is 5,000 lbs.; cab to axle dimension is 44 11/16 in. Front springs in these units also have been increased to 39 in. and wheel housings have been removed from the stake and platform bodies. The express body measures 48¼ in. wide and has been lengthened 6 in. to a total of 90 in. The ¾-ton trucks have new pistons, lighter in weight, more resistant to wear and less likely to scuff during breaking in period. As in the ½-ton models, engines are mounted on rubber. Optional rear axle ratios of 3.73, 4.1 and 4.78.

Body types in the 1-ton series are panel, express, platform, stake, canopy and screen. Maximum gross rating is 6,000 lbs. Two wheelbase lengths are available, 120 and 133 in. Cab to axle dimension on the 120-in. wheelbase is 44 11/16 in. and 57 11/16 in. on the 133-in. wheelbase. Engines are mounted on rubber to reduce vibration. The three optional rear axle ratios are 4.3, 4.78 and 3.9.

(TURN TO PAGE 112, PLEASE)



A New Heavy Duty 8-Speed Transmission by FULLER



Three sets of helical gears in the front section, and herringbone reduction gears in the rear section make this new FULLER Transmission remarkably quiet. Shifting is feather-light, due to the staggered tooth shifting clutches. The unit is made throughout for the heaviest service, and is recommended for off-the-highway service and also for heavy duty transport where a wide range of closely graduated gear ratios is necessary for fast hauling of big pay loads.

4 Models

This new eight-speed unit is available with gear ratios to meet virtually every need. Models 8A86 and 8B86 have underdrive. Models 8A860 and 8B860 have overdrive. Engineering data and specific recommendations sent upon request.

FULLER MFG. CO.
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FRUEHAUFS *Everywhere*

● **THE record of Fruehauf Trailers in the service of over 100 different industries is an "open book" for all to see. These attractive commercial vehicles are on the job everywhere—serving and "standing the gaff" of hard going in all lines of trade. Everywhere the professional haulers, the men whose only source of income is in the efficient operation of haulage equipment, have made Fruehauf Trailers their first choice—using more Fruehaufs than any other make! This is a tribute that we deeply appreciate and a responsibility of which we are keenly aware. Before you buy any haulage equipment judge by what others are doing. If you want economy — use Trailers. If you want utmost economy—use Fruehaufs.**

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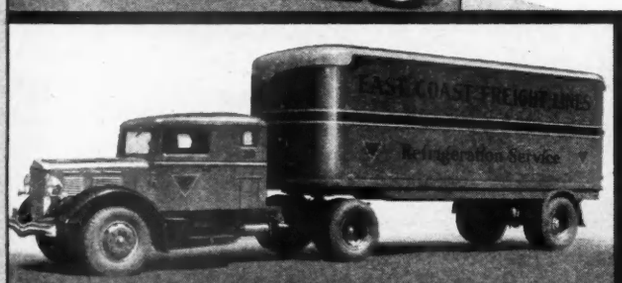

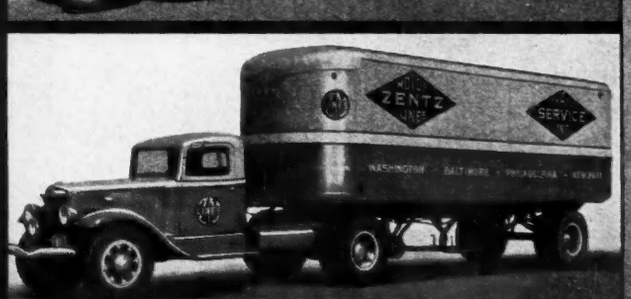

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(CONTINUED FROM PAGE 110)

Dodge offers two lines of 1½-ton trucks—standard and heavy duty models with respective gross rating capacities of 10,000 and 12,000 lbs. Both lines are available in three wheelbase lengths: 126½, 133 and 160 in. Body types are platform, stake and an express on the standard only. The heavy duty line offers a special wheelbase of 190 in. for school bus service and for van type bodies. Accessibility and comfort are two features of the 1½-ton cab-over-engine available on the heavy duty chassis and developed by Montpelier Mfg. Co. for Dodge. Cab-over-engine wheelbase lengths are: 108, 133 and 160 in. Single and dual rear wheels will be interchangeable on one hub. Rear springs shackle pins and front eye bolt are larger in diameter; front spring shackles are heavier. Optional rear axle ratios are 5.428, 4.875 and 5.857.

Two-ton trucks have a maximum gross rating of 14,000 lbs. and are placed on the market in wheelbase lengths of 136 in. (cab to axle 60 11/16 in.) 148 in. (cab to axle 72 11/16 in.) 160 in. (cab to axle 84 11/16 in.) 178 in. (cab to axle 102 11/16 in.) and 220 in. (cab to axle 144 11/16 in.). These models are provided in flat face cowl, windshield cowl, cab and platform and stake in the 136 and 160 in. wheelbase chassis. The Montpelier cab-over-engine also is available in the 2-ton line. Wheelbase lengths are 108, 136 and 160 in. Front wheel king pin and inner wheel bearing diameters have been increased. The 2-tons have optional rear axle ratios of 5.11, 5.625, 6.33 and 7.1.

Dodge will continue to offer 3-ton models in conventional and cab-over-engine chassis, the former available as cab and chassis, cowl with windshield and flat faced cowl. The 3-ton cab-over-engine is manufactured by Dodge in wheelbase lengths of 96, 108, 122 and 140 in.

Features found in the new Dodge diesel include the following:

Automatic Injection Advance. Engineers say this is the first diesel engine with injection timed according to engine speed.

Injection Pump. Dodge has a simplified injection pump which is compact and employs one valve that meters for all cylinders.

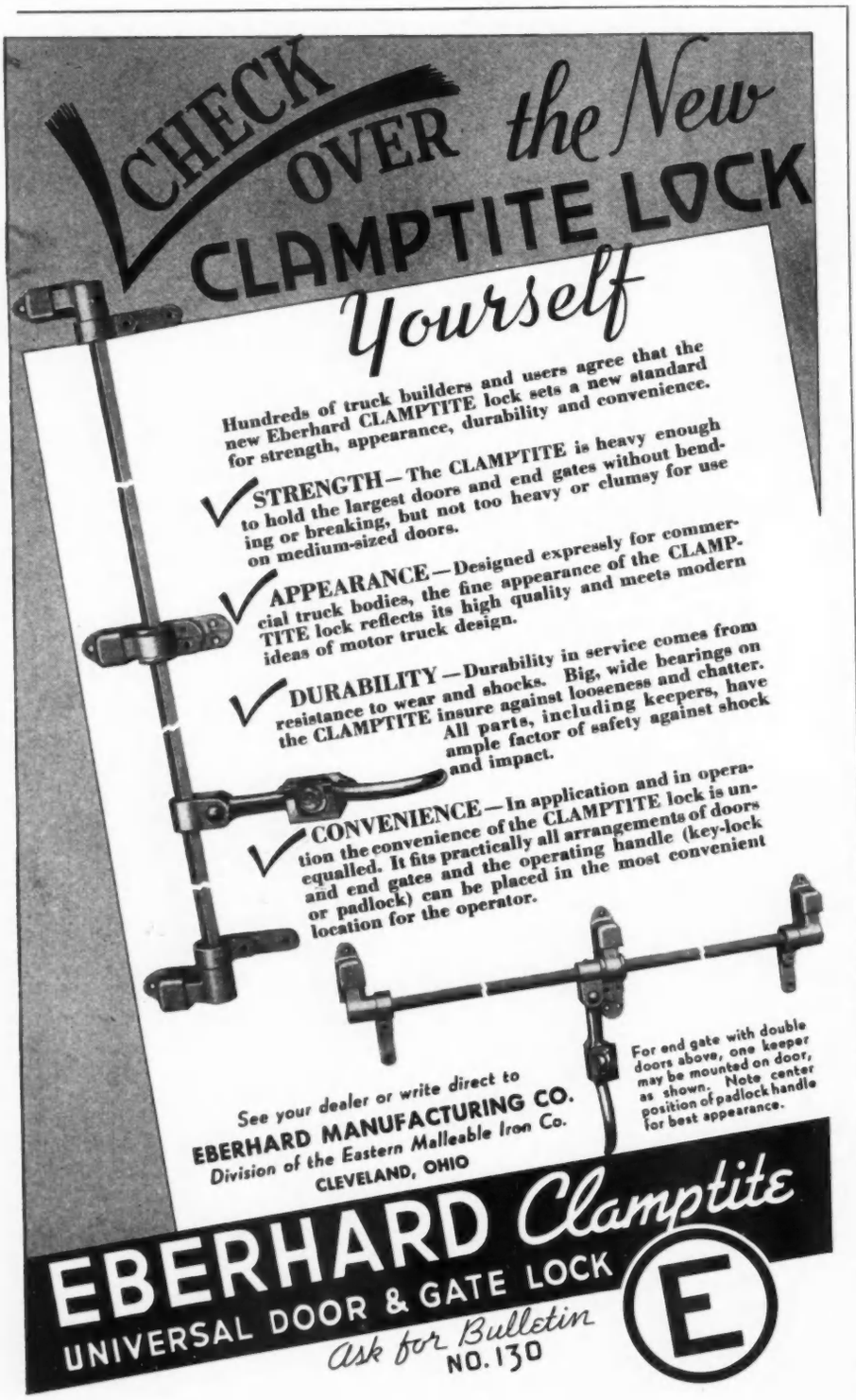
Anti-clogging nozzle. Dodge's pressure controlled pintle cleans nozzle after each injection.

Cold Weather Starting. This engine has choke-method starting controlled by a pull-out lever on the instrument board. Choking automatically stops when the engine is running.

"Energy Cell" Controlled Combustion. High turbulence means of thoroughly mixing fuel and air for uniform complete combustion assures maximum power and fuel economy. This diesel has the Double-O combustion chamber which concentrates main mass of air at center of chamber where fuel is injected.

Starting aids are unnecessary because of the intake air heater located in the air intake manifold. This is controlled from the dash board, is set according to temperature and automatically shuts off to save the battery. Even in coldest weather it is unnecessary to employ blow torches for starting.

Complete specifications of all new Dodge models are published on p. 46.


CHECK OVER the New CLAMPTITE LOCK Yourself
Hundreds of truck builders and users agree that the new Eberhard CLAMPTITE lock sets a new standard for strength, appearance, durability and convenience.
STRENGTH—The CLAMPTITE is heavy enough to hold the largest doors and end gates without bending or breaking, but not too heavy or clumsy for use on medium-sized doors.
APPEARANCE—Designed expressly for commercial truck bodies, the fine appearance of the CLAMPTITE lock reflects its high quality and meets modern ideas of motor truck design.
DURABILITY—Durability in service comes from resistance to wear and shocks. Big, wide bearings on the CLAMPTITE insure against looseness and chatter. All parts, including keepers, have ample factor of safety against shock and impact.
CONVENIENCE—In application and in operation the convenience of the CLAMPTITE lock is unequalled. It fits practically all arrangements of doors and end gates and the operating handle (key-lock or padlock) can be placed in the most convenient location for the operator.
For end gate with double doors above, one keeper may be mounted on door, as shown. Note center position of padlock handle for best appearance.
See your dealer or write direct to
EBERHARD MANUFACTURING CO.
Division of the Eastern Malleable Iron Co.
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UNIVERSAL DOOR & GATE LOCK
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E

Every refrigerated truck needs this "economy-dividend" insulation

You get refrigeration economy by using this insulation, because it's more efficient in warding off heat.

• When your truck body insulation saves refrigeration, you are gaining an "economy-dividend" on your insulation investment. This is why so many refrigerator operators always specify Dry-Zero.

Builders of refrigerated trucks have used Dry-Zero in a majority of the bodies in service. This insulation has also been used in 8 out of 10 new refrigerated railroad cars, and in more than a million household refrigerators.

Dry-Zero has been chosen repeatedly for the most exacting insulation requirements. It has been used successfully for such widely different insulation jobs as transport airplanes and containers for liquid oxygen.

Unless you use this insulation, you may waste refrigeration and increase operating expense. Get the facts for yourself! Investigate Dry-Zero insulation before you build your next truck body.

READ THESE INSULATION FACTS

1 Dry-Zero's remarkable insulation efficiency rating of .24 has been measured by several independent authorities, such as the U. S. Bureau of Standards.

2 The high insulating efficiency of Dry-Zero means full protection against outside heat. It means low inside temperatures over long periods of time, at the least refrigerating expense.

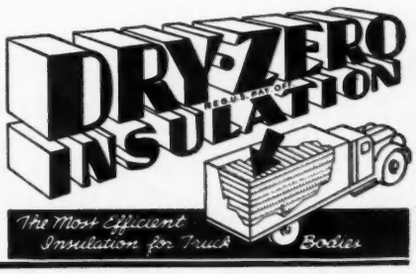
3 Furthermore, truck operators' records show that Dry-Zero keeps its insulating efficiency for the entire life of the truck. It is not ruined by moisture, settling, disintegration, or molds.

4 Dry-Zero is so light-weight that it adds little to the dead-weight of the truck. This means greater payload capacity.

5 In addition, because of its insulating efficiency, less thickness is needed; therefore, walls can be thinner, leaving more room for cargo.

6 Dry-Zero is easy to install. The exact amount needed can be calculated in advance. You can order either Dry-Zero Blanket Insulation or Dry-Zero Sealpad Insulation cut to size.

ZERO FOR ICE CREAM—In this Dry-Zero insulated truck, ice cream is delivered at 0°F. Operating in New York City, refrigeration expense might be excessive if Dry-Zero were not used in walls and roof. James J. Morrissey, contract hauler, operates the truck. Mack Trucks, Inc., is the builder.



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ROADS

(CONTINUED FROM PAGE 29)

prosperity of the country."

J. S. Young, in his thorough work, a "Political and Constitutional Study of the Cumberland Road," points out that the commercial aspect of early roads for the moving of settlers and of freight cannot be over-estimated. It was a question of transportation, he says, that caused the whiskey insurrection in Pennsylvania: a question of transportation that alienated the people of western New York and drove them to trade with Montreal.

After cessation of Federal Aid to the Cumberland Road before the middle of the last century nothing was done by the central government to support the building of good roads until 1916. Just prior to that time bills for aid to roads were introduced and reports made, but the first act was passed in 1916 and the second in 1921. The general attitude of the Federal Government has not been changed since that time. What was that attitude?

The Sixty-third Congress issued a memorable report, Federal Aid to Good Roads, which contains the following paragraphs: "Federal Aid to good roads will accomplish several of the objects indicated by the framers of the Constitution — establish post roads, regulate commerce, provide for the common defense, and promote the general welfare. Above all, it will promote the general welfare. Better, cheaper, and additional transportation facilities in the United States must benefit every inhabitant and result in more development and greater productiveness in our natural resources, meaning more and cheaper food and necessities of life."

In the Congressional Record of Jan. 24, 1916, Rep. J. Charles Linthicum, of Maryland, had this to say on the subject: "Better roads mean cheaper transportation; cheaper transportation means cheaper foodstuffs and living. . . . Why improve the rivers and harbors and not improve the great highways of the land over which must be transported the wheat, corn, the cotton, the cattle and hogs, and every article we eat and wear?"

Two months later, Senator George Norris, of Nebraska, commented: "What I have said about the automobile applies to the automobile truck as well. There are many places where there is a great deal of interstate traffic in produce from the farms. It applies also to the carrying of the mails; and I can see how it is going to be extended, it seems to me, greatly."

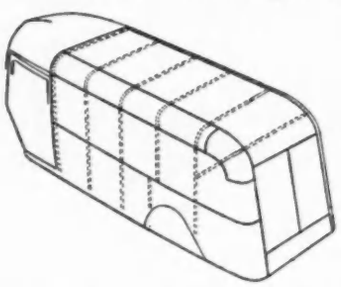
Senator John Sharp Williams, of Mississippi, in the Congressional debate in 1921, remarked: ". . . if we are going to allow these appropriations to degenerate into a provision for fancy interstate travel by automobile, then we have lost sight of the real and substantial objects of the legislation . . . it is not to make traveling by passengers easier and better; that is not its object; but it is to make the delivery of products cheaper and easier and better with less wear and tear upon the machinery transporting it and with greater cheapness of transportation itself."

On the same subject Congressman John M. Robsion, of Kentucky, argued: "It will bring the producers and consumers of America together

(TURN TO PAGE 116, PLEASE)

Holds Down *Both*
BUILDING AND OPERATING COSTS

● The fast-growing preference of C. O. E. body builders and operators for bodies of Plymetl is largely due to six distinctive dividend-earning features: (1) Exceptional workability that makes possible substantial construction economies. Plymetl may be formed to compound curvature on braces. (2) Amazing strength and stiffness that eliminates many space-consuming internal braces and uprights. (3) Lightness that reduces deadweight to a minimum. (4) Insulation against heat, elimination of drumming. (5) Unusual impact resistance, and (6) flat surfaces that eliminate distorting highlights provide unusual beauty.



Drawing at left shows suggested application of Plymetl for side, rear, door and roof panels of a cab-over-engine delivery truck . . . illustrates how the use of this material eliminates many costly fabricating operations, and provides fine smooth sides for advertising display. The weight of this Plymetl body, including paneling, roof, doors, braces, floor and outrigging, is 800 pounds. This minimum deadweight, plus extra payload space made possible by elimination of many internal braces, means lowest possible cost per ton mile.

HASKELITE MANUFACTURING CORPORATION
208 W. Washington St., Chicago, Ill. · Detroit · New York · Los Angeles

"PLYMETL"

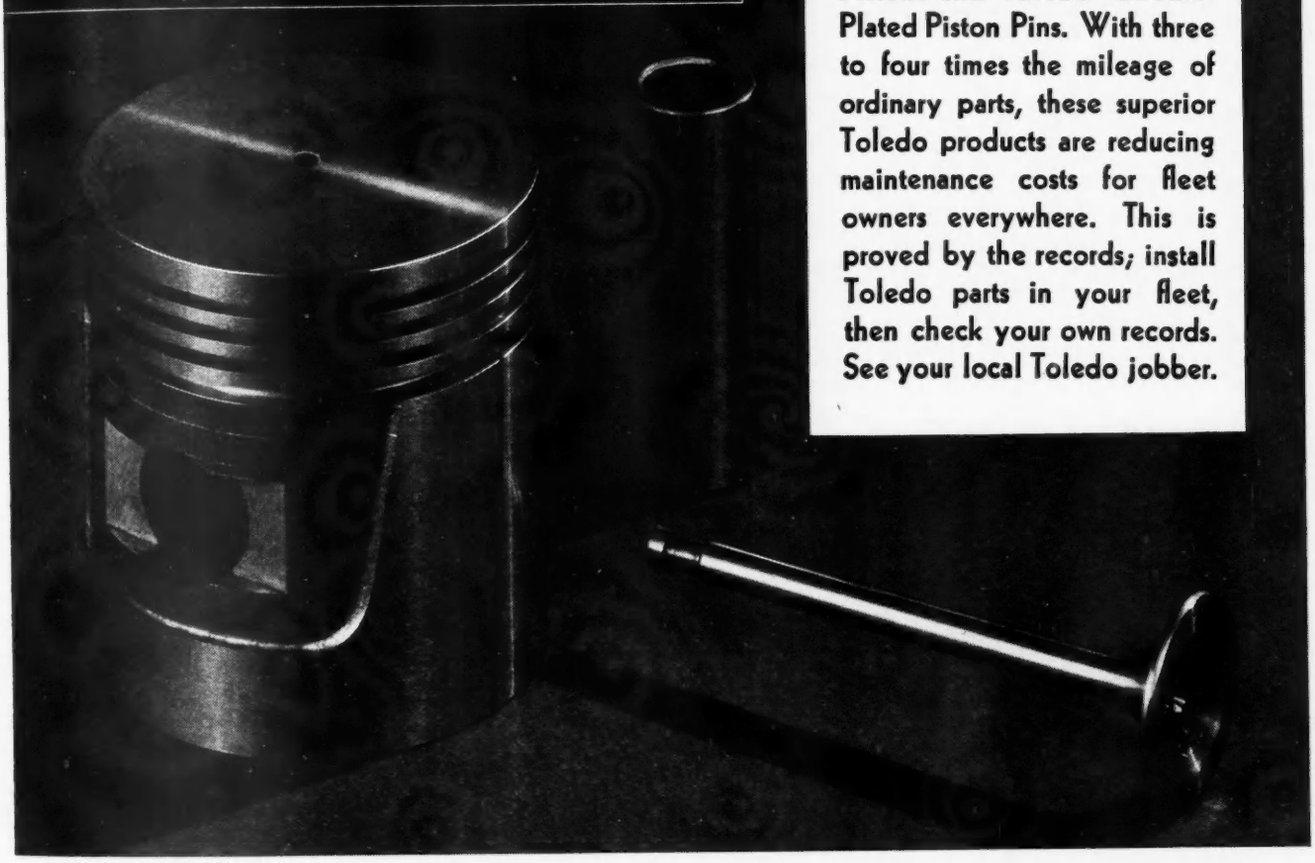
AEROTYPE VALVES

AEROTYPE PISTONS

CHROME-PLATED PINS

Best for heavy duty

Successful, economical fleet operation demands the extra performance of Toledo Aerotype Valves, Toledo Aerotype Pistons and Toledo Chrome-Plated Piston Pins. With three to four times the mileage of ordinary parts, these superior Toledo products are reducing maintenance costs for fleet owners everywhere. This is proved by the records; install Toledo parts in your fleet, then check your own records. See your local Toledo jobber.



THE TOLEDO STEEL PRODUCTS COMPANY · TOLEDO, OHIO, U. S. A.

Warehouses: Atlanta · Boston · Chicago · Cleveland · Dallas · Detroit · Kansas City · Minneapolis · New York Philadelphia · St. Louis · Los Angeles · San Francisco · Portland · Seattle

TOLEDO

(CONTINUED FROM PAGE 114)

and be most helpful to both the producer and consumer . . . they (good roads) will always be a mighty factor in time of war in mobilizing both our men and our material. At the same time they mean so much for the wealth and prosperity of the nation in times of peace."

An annual "mud tax" of $700,000,000 was to be avoided, according to Senator Claude Swanson, of Virginia, now Secretary of the Navy. ". . . we would certainly save, under all conditions, about eight or nine cents per ton a mile in hauling this immense tonnage, which would save in transportation cost over $700,000,000 per year . . . in other words, the United States pays annually a mud tax of $700,000,000."

Both major political parties have dealt with the subject of roads and the Democratic platform in 1924 included this statement: "Improved roads are of vital importance, not only to commerce and industry, but also to agriculture and rural life." (The Republicans, pledging continued Federal aid, were elected.)

In the light of the fact that expenditure of Federal money was involved, the real attitude of Congressmen toward the use and purpose of roads is most illuminating.

Revealing testimony is found in the words of Senator Lawrence C. Phipps, of Colorado, speaking in Congress in 1925 on Federal aid. "It is not, however, the pleasurable use of the automobile which I consider the most important. I look upon the commercial development of our country as the main inducement for the making, the upkeep, and the development of good roads in the United States."

Senator Furnifold M. Simmons, of North Carolina, speaking to the Upper House in 1925, opined: ". . . the time is not far distant when those great trunk highways will be used as regular lines of long distance motor bus and truck transportation, running on regular schedules, just as they now are run in and around the larger cities and towns."

In 1926 during Senate consideration of Federal expenditures for roads, Senator Phipps said, "There is another use of the roads for national defense which is sometimes overlooked. It was succinctly expressed by General Pershing when he appeared before our Post Office Committee in 1921 and said: 'The county road will be of tremendous value in time of war. The roads must be relied upon to obtain the needed food supplies.' "

Propagandists against commercial vehicles pay scant attention to the truth when they harangue people into believing trucks have no place on the highway.

The Problem Faced Squarely

One fact must be recognized—that public roads, whether started as trails or as highways, have almost universally been used by all-comers, and were so designed. Until recently there has been but little argument as to proper and permissive use. True, some roads or ways were built largely for military purposes and reasons, but other than military travel has been allowed. Commercial vehicles, though first in the minds of Congress, have not claimed pre-emption rights. To them a public road has meant what the name implies.

(TURN TO PAGE 118, PLEASE)

Adopted as Standard Equipment

BY AMERICA'S LEADING MANUFACTURERS OF TRUCKS, TRACTORS AND TRAILERS

FRUEHAUF • Oldest and Largest manufacturers of truck-trailers, uses MIDLAND Power Brake Equipment

MIDLAND POWER BRAKE KITS
are engineered expressly for
FORD • CHEVROLET • DODGE GMC • AND INTERNATIONAL

• Leading truck and trailer manufacturers—the largest fleet operators—those whose business it is to know the facts—all choose Midland Power Brake Equipment. Let this fact be your guide in selecting power brake equipment for *your* fleet.

For simple design, rugged construction and lower cost operation, specify Midland—both for your new truck or trailer, or for your present equipment.

Ask your nearest Midland distributor today for complete information and prices, or write us direct.

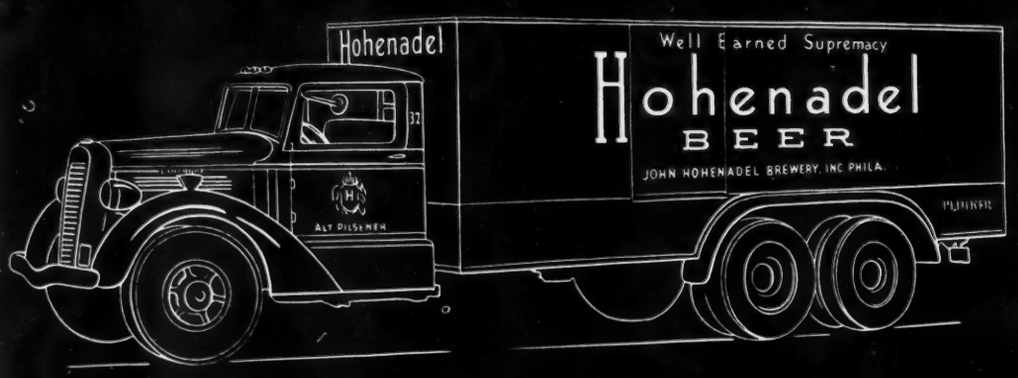
THE MIDLAND STEEL PRODUCTS CO.
10605 Madison Avenue • Cleveland, Ohio
Export Dept. • 38 Pearl St. • New York City

SEE OUR EXHIBIT AT THE NATIONAL MOTOR TRUCK SHOW

MIDLAND POWER BRAKE EQUIPMENT
MIDLAND (CHRISTENSEN) *Power Brakes*
SAFETY POWER

SAVES HAULING COSTS ON 2,035 POUNDS....

A conventional truck body of this type weighs 5,300 pounds. Built of DYN-EL, it weighs 3,265 pounds... A saving of 2,035 pounds... Yet the body of DYN-EL costs no more.



Truck body—225" long x 82" wide x 55" high. Built by Barry & Baily Co., Philadelphia, for John Hohenadel Brewery, Inc.

Dyn-el is 50% stronger than ordinary sheet steel . . . 60 to 150% more resistant to corrosion than copper-bearing steel (4 to 6 times ordinary steel). In the 48-page book, "A.W." Presents Dyn-el, you will find full details of savings in weight and cost possible with this new high-strength, flat-rolled steel . . . plus engineering and mechanical values. Diagrams, tables and charts cover a wide range of tests and properties. To executives, this book gives a quick picture of performance and costs. To engineers, it gives complete fabricating and design properties and table of sizes and weights. We will be pleased to send you a copy.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNSYLVANIA :: SINCE 1826 :: DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Detroit, Los Angeles, Seattle San Francisco, Houston, Buffalo, Pittsburgh, Cleveland, Chicago, Cincinnati, New Orleans, St. Paul, St. Louis, Montreal. PRODUCTS INCLUDE —"A.W." Rolled Steel Floor Plates : : "Swede" Pig Iron : : Billets—Blooms and Slabs : : Sheared Steel Plates : : Hot Rolled and Hot Rolled Annealed Sheets and Strip : : Steel Products also furnished in Copper and Alloy analyses

(CONTINUED FROM PAGE 116)

In recent years, a few roads constructed in parks or other public areas have had aesthetic satisfaction as their primary function. Skyline Drive in Virginia is one of the newest and most popular in the Atlantic Coastal section. To exclude from this ribbon-way to fairyland the trucks and commercial vehicles necessary for supplying and servicing the various inns and stations located in the region would neither satisfy the prejudiced nor permit the park to stay open for those who would enjoy it.

Much of what we call pleasure is really business. The mechanic, or the professional man, traveling in a "pleasure" car to and from work is using his car and the highway to a business end. The jurist riding in his sedan to a court session and the corporation tycoon going to a board meeting, both use the conveyance and and the highway as a means to a business end. And the same is true with myriad other men and women in a thousand occupations and walks of life. Without the instrument of travel and the roadway over which it moves, these salaries and incomes would not be made, no dividends earned, nor court opinions handed down.

Only in relatively recent years has travel for purely sightseeing purposes become of significance. Commercial transportation, however, is as old as recorded history. Came the development of the automobile in the second decade of this century; motorists took time out to view the length and breadth of the land and to report on the "fullness thereof."

Most American families contribute, in greater or less degree, to the number of the public traveling as sightseers for sheer pleasure. And every individual American benefits from the commercial use of the roads. Most highway users engage in some business use of the highways. Every user of a motor vehicle helps pay for roads. If the sightseer becomes so inanely selfish as to attempt or desire to legislate the other user off the highway, he admits ignorance of the purpose for which roads were built. Two things would result from his plan. His own motor taxes would leap skyward, because he must shoulder the road tax burden alone. In the second place, his cost of living would suddenly mount as a result of his ill-conceived plan to monopolize the highway system and to remove the commercial truck from the transportation picture.

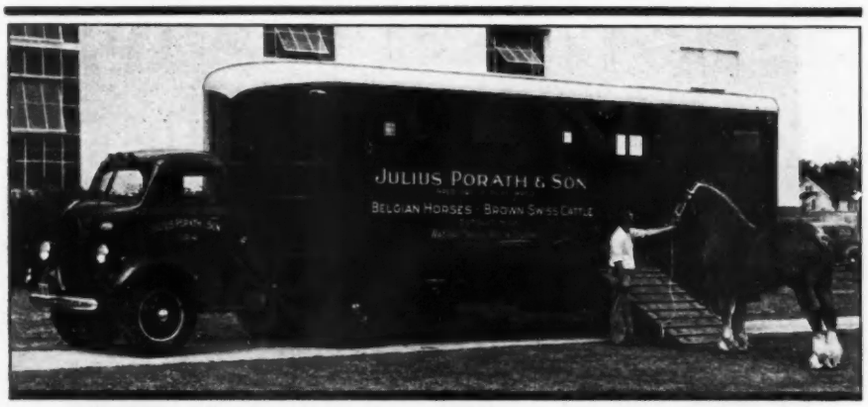
Duplicate highway systems in this country are unnecessary, and to highway users are economically suicidal. Limitless revenues for road building do not exist. Better to share the road than lose it as the railroads apparently are doing with their property.

A brief survey of legislation shows that the past gave no exclusive legacy in our road system to sightseers. Many 'ways lead through magic casements and rapturous vistas, but very few were constructed for that as a sole or primary purpose.

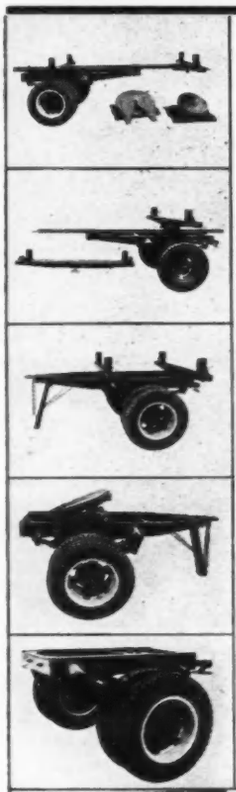
McKay Tells "Where-to-get-it"

During October, The McKay Co., Pittsburgh, Pa., began a nation-wide mailing to fleet owners, showing the advantages of its line of truck chains and telling them where to get quick deliveries, locally.

A hang-up card, bearing the name of the man receiving it, is sent to each fleet owner on the mailing list. This card shows at a glance the names and addresses of McKay jobbers in the fleet-owner's vicinity.



GRAMM TRAILERS



DESIGNED Especially to Meet the Exact Requirements of *YOUR* Business.

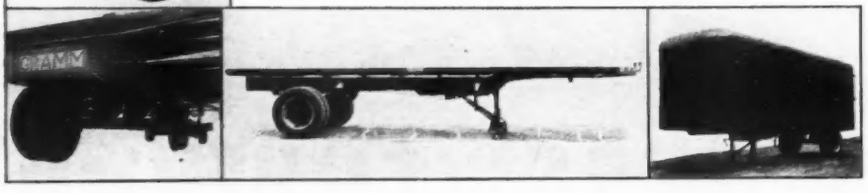
Gramm Engineers have designed what is considered the most advanced combination of Spring Suspension and Brake Hook-up for Safe Trailer Operation. This design is available in several sizes and types of Semi, Pole, Utility and Four Wheel Trailers, together with Front and Rear Dollies.

These features may also be incorporated in a special unit designed for *you*, as illustrated by the type shown above which was built complete in the Gramm Shops. Users and Dealers should write for detailed data.

The small illustrations from top to bottom and across show:

Type PA Pole—used with fifth wheel equipped truck.
Type PB Pole—used with body equipped truck.
Type PC Utility—used for loads of poles, pipes, etc.
Type PD Front Dolly—for converting semi into four wheel trailers.
Type PE Rear Dolly—used to modernize old trailers or as a part of new body or frame designs.
Gramm Spring Suspension and Safety Brake features.
Gramm Semi-Trailer Chassis with Steel Sub Base.
Gramm Van Body for variety of uses.

GRAMM TRAILER DIVISION
DELPHOS, OHIO, U. S. A.
Division Gramm Motor Truck Corp.



In Truck Operation There's No Substitute for SAFETY

HY-POWER LONG-LIFE CLEARANCE LAMPS

FOTO-RAY BREAK-PROOF REFLECTORS

ACE Leak-Proof FLARES

PROTECTO RUBBER-RIM MIRRORS

HY-POWER TURN SIGNALS

HY-POWER FOG LAMPS

IN SAFETY EQUIPMENT THERE'S NO SUBSTITUTE FOR

KING BEE

Quality

There's a reason for KING BEE popularity with truck operators. It's QUALITY . . . construction that assures longer life, and more than meets I.C.C. and state requirements.

AMERICAN AUTOMATIC DEVICES CO.

THROOP, HARRISON AND CONGRESS STREETS • CHICAGO, ILL.

MODEL No. 855
De-luxe design; 7-in. lens; chrome or black enamel.

Now . . .

3 excellent K-D FOG LAMPS Models No. 855, 857 and 850 stand ready for duty . . . each one a leader in its class. You need all three!

Special lenses, beautiful bodies, rugged brackets, quality-built, and thrift-priced for quick turnover.

CATALOG NO. 38 READY—WRITE

Members by Invitation—Rice Leaders of the World Association

The K-D Lamp Co.
CINCINNATI, O.

FOR LOW COST MAINTENANCE
Specify BLOOD BROTHERS

UNIVERSAL JOINTS

Whatever your requirements, if your problem is to transmit power at an angle, our field and factory experience of more than 30 years is at your command. Our Engineering Department will gladly submit quotations covering your requirements.

BLOOD BROTHERS
MACHINE COMPANY
DIVISION OF STANDARD STEEL SPRING COMPANY
ALLEGAN • • MICHIGAN

Mack Diesel and Light Delivery

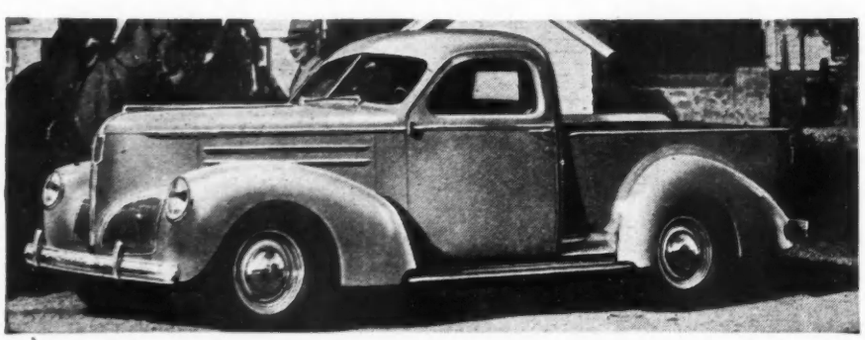
Mack will display a diesel engine of its own manufacture at the National Motor Truck Show supporting rumors of long standing.

The Lanova energy-cell combustion system was selected as offering the highest m.e.p. with the lowest peak pressures, moderate compression and injection pressure and the cleanest and smoothest operation. At present, the Mack-Lanova is being produced in a single size—519 cu. in. displacement—developing 131 hp. at 2000 r.p.m.

Mack is exhibiting a lighter Mack than ever before offered. It is rated at 8500 lb. gross vehicle weight, equivalent to the light 1-1½-tonners in other lines. This model, to be known as the Model ED extends the Mack line to include models in every size from 8500 lb. gross to 91,000 lb. In appearance the new model closely resembles Models EE, EF and EG and employs, in smaller scale, much the same design.

DiVco Wins Patent Rights

Baker-Raulang Co. and the Truck Engineering Co., both of Cleveland, Ohio, have discontinued the manufacture of vehicles driven by an operator in a standing position, and have compensated the DiVco-Twin Truck Co., Detroit, for past infringements of its patents in the stand-drive field, and have acknowledged the validity of DiVco-Twin patents. Baker-Raulang has been granted a license under patents owned by DiVco-Twin for the manufacture of vehicles other than the stand-drive type.



The 1939 Studebaker Coupe Express has acquired the graceful new lines of the State Commander, yet has a full rated capacity of 1000 lb. Exceptional driver comfort and rugged construction are combined in this new two-purpose vehicle.

FORD

(CONTINUED FROM PAGE 39)

by 1½ in. brakes inside the rear drums. The total lining area is 466.86 sq. in.

Brakes on the one-ton units are 12 by 1¾ in. in front and 14 by 2 in. in rear, the total lining area being 201.21 sq. in. Those on the commercial cars are 12 by 1¾ in., front and rear, the total lining area being 162 sq. in. The hand brake operates the two rear wheelbrakes on both chassis.

All brake drum rings are cast iron with steel drum discs for greater strength and reduced weight. Drums for the larger brakes are cast with a heavy rib for additional reinforcement.

Improved front end styling features the conventional truck types and commercial cars. Trucks and 112-in. panel, stake and pickup have new style radiator ornaments and wider chrome bands around the radiator grille. The sedan delivery is styled like the standard passenger car.

TRUCKSTELL CONVERSIONS

Illustrated above is Truckstell Model 500, a Ford C.O.E. chassis with full Truckstell conversion including two-speed axle, strengthened frame and larger brakes. The unit carries a gross rating of 16,000 lb. and has a capacity from 2½ to 5 tons.

Like other Truckstell models, available in various capacity ratings for Ford and Chevrolet trucks, the unit was converted by Truckstell in its own distributors' shops, and carries an official certificate of rated capacity. The conversion packages are not available for assembly outside the Truckstell organization.

CATECHISM

(CONTINUED FROM PAGE 27)

children, competent and incompetent, experienced and inexperienced, sober and drunk, driving cars up to 70 or 80 miles an hour and killing 30,000 people a year and injuring 1,000,000 a year, it seems to me absurd to say that 20 ft. roads are being built because 1 or 2 per cent of all vehicles are a foot wider than ordinary farm trucks."

—R. L. Morrison, Professor of Highway Engineering and Highway Transport, University of Michigan.

"I think it is generally true that most highway bridges were designed to carry vehicles with 15 tons on the rear axle even before the advent of the trucks."

—F. Lavis, Consulting Engineer, New York, N. Y., Member of the National Research Council.

"Contrary to the popular impression, the concentrated loadings of motor vehicles which may legally be used on our highways are not increased over the loads which were provided for prior to the advent of a single motor truck or bus. The specifications for the early macadam roads in this country generally provided that a 10 or 15-ton road roller, with two-thirds of the weight on the rear axle, should be used."

—Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads; in "Current Phases of Highway Building and Maintenance," pages 11 and 12.

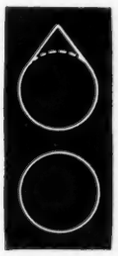
"The present opinions of those responsible for the design and construction of pavements in Iowa, is that if there were no commercial busses and trucks using those roads at all for hire, we would still build about the kind of system we have at present so far as thicknesses go."

—Dean Anson Marston, Iowa State College.

(TURN TO PAGE 122, PLEASE)

This CLAWING WEDGE DOES THE TRICK

Guarantees sure grip... Multiplies chain mileage



It takes a super-built chain to withstand the "gaff" of heavy trucking operations—pushing through loads that run into tons, and getting them through on time.

CLAW Truck Chains are geared to this kind of service—built for abuse. Take the CLAW wedge of the cross chain link, for example. A revolutionary idea in chains! This knife-sharp wedge of extra steel bites in at the point of traction—gives a positive hold. There's 20% more metal in these CLAW links than you find in ordinary links (see diagram, upper left). And every CLAW cross chain link is built of CLAW-alloy, toughest chain metal known! No wonder CLAWS get trucks through quicker at minimum chain expense.

Special Indented Rim Chains eliminate play and prevent excessive breakage between cross chains and rim chains. The improved BLUE BOY Fastener snaps on in a jiffy, can't work loose.

Specify CLAWS for your trucks and get modern "traction insurance" at lowest cost per mile. Full particulars on request.

COLUMBUS-McKINNON CHAIN CORP.

General Offices: TONAWANDA, N. Y.

Plants at St. Catharines, Ont. Can. *and* Vereeniging, So. Africa

CLAW ★ TRUCK CHAINS

When writing to advertisers please mention Commercial Car Journal

CATECHISM

(CONTINUED FROM PAGE 121)

"It is difficult to assign any additional cost in our highway construction as being entirely due to heavy truck traffic. . . . As regards the thickness of the pavement, it is my opinion that frost action is the most destructive force we have to contend with, and it is necessary to design a slab which will not break up and crack under these forces. Such a slab is amply sufficient to carry any traffic which may move over it."

—Major William G. Sloan, State Highway Engineer of New Jersey.

"Agitation for motor vehicle taxation is changing as experience indicates that the destruction of highways does not arise so much from their use by motor vehicles as from the effects of cold and heat, of contraction and expansion and the other elements of natural depreciation."

—L. A. Rossman; in "Railways and Highways," Grand Rapids, Minn., 1935, page 21.

QUESTION 4

What is the importance of highway transportation with respect to employment?

ANSWER

"Motor trucks probably give work in intercity business to more men than the railroads employ."

—Joseph B Eastman, Federal Coordinator of Transportation; in address before the Motor Truck Club of Massachusetts, June 11, 1935, page 3.

"At least upwards of 800,000 men are directly and indirectly dependent upon the income from the Federal and State highway construction and maintenance activities."

—Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads; in "What Highways Mean in the Economic, Educational and Social Life of the U. S.", before the Highway and Building Congress, Detroit, January 19, 1933, page 15.

"All told, over four million people are employed in the automobile industry, in automotive transportation and related industries. This employment accounts for the support of not far from a fifth of all the people of the United States."

—L. A. Rossman; in "Railways and Highways," Grand Rapids, Minn., 1935, page 2.

"In all, the motor transport industries provide employment for more than 4,500,000 workers or about 10 per cent of those 'gainfully employed' in the United States. This does not include the thousands of 'little fellows' that make a living from parking lots, tourist camps and wayside stands the country over."

—Col. Willard Chevalier, Vice-President, McGraw-Hill Publishing Co.; in "A Tax to Throttle Progress," radio address, February 25, 1935, page 3.

QUESTION 5

Is highway competition mainly responsible for the decline of railroad employment?

ANSWER

"Increasing efficiency in railroad operation in recent years has materially reduced the demand for labor in the industry. We have already seen that between 1900 and 1930 the volume of traffic per employee has increased by 65 per cent, the greater part of the improvement occurring since 1922. Notwithstanding the growth of traffic in the decade of the twenties, the total number of employees showed a material reduction."

—Edwin G. Nourse and Associates, The Institution of Economics of The Brookings Institution, "America's Capacity to Produce," page 370.

"Whatever the future may hold in the way of increased industrial activity and larger traffic volumes for the railroads, relief from the intolerable unemployment in the railroad industry cannot be hoped for on the sole basis of greater traffic volumes. Railroad managements have stated that they can now handle a 20 per cent increase in business without any increase in employment."

—Alexander F. Whitney, President of the Brotherhood of Railroad Trainmen and Chairman of Railway Labor Executives Association, Cleveland, Ohio; in statement before the Senate Committee on Interstate Commerce, March, 1934, when a six-hour day bill was under consideration. (S. 2519.)

Employment by Class I Railways in the United States

	Gross Railroad Operating Revenue	Freight Revenue	Railway Employees
1920	$6,178,438,459	$4,328,297,621	2,022,832
1929	6,279,520,544	4,825,622,121	1,660,850
1933	3,095,403,904	2,492,678,146	971,196
1936	4,052,734,139	3,308,540,696	1,065,624

"From 1916 to 1936 the tractive power of average steam locomotive has been raised from 33,188 pounds to 48,972 pounds, an increase of 48 per cent."

—"A Yearbook of Railroad Information," 1937 Edition.

QUESTION 6

Can substitution of highway for railway transportation result in a net loss of employment?

ANSWER

"Today net loads of 10,000 tons—the equivalent of 1000 big trucks manned by at least 1000 men—are commonly hauled in a single train with a crew of five. . . ."

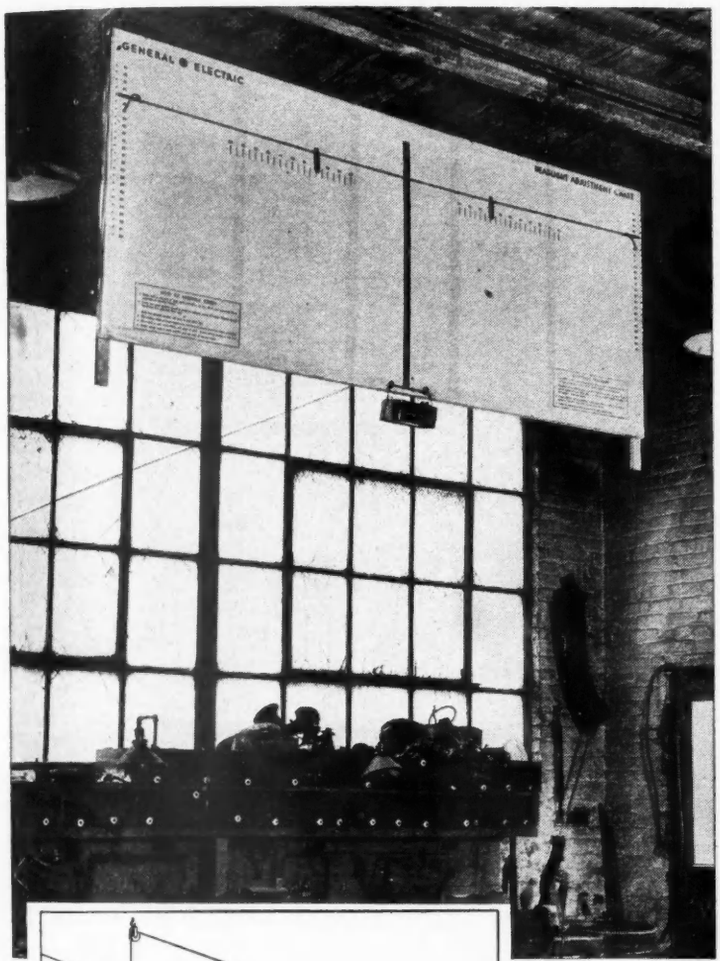
—Daniel Willard, President of the Baltimore & Ohio Railroad, as reported in interview by Donald Wilhelm in the Saturday Evening Post, November 5, 1934, article entitled "Diesels and Dollars."

"Comparison between truck and rail freight movement may be made from another angle. The loading of the average freight train in 1930 was 785 tons. To handle such a train required an engine and train of five to six men. The same tonnage transported by motor trucks at an average loading rate of five tons per truck would require the employment of 157 trucks with 157 truck drivers.

"Suppose the freight burden falls in principal measure on the motor truck. On the statistical basis . . . an addition to present number of trucks in service would be required amounting to 5,680,000 units. . . . These 5,680,000 trucks would call for at least 5,680,000 drivers. . . ."

—Dr. J. Parmelee, Chief of the Bureau of Railway Economics, before the Interstate Commerce Commission on September 5, 1931.

ARE YOU STILL USING A BLANK WALL TO TEST HEADLIGHTS?



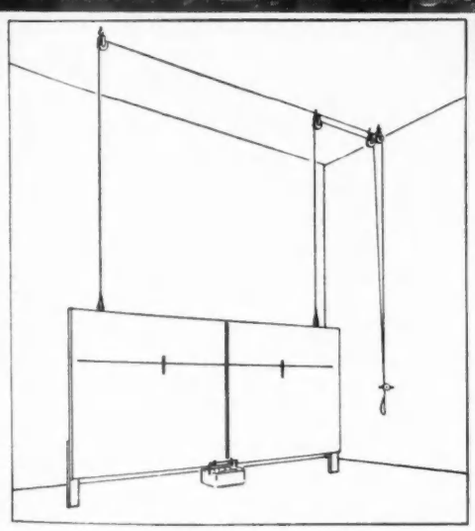
G-E Safety Lighting Service equipment will help you do this job accurately and economically

MANY fleet owners are still using a blank wall to check headlights and aim beams. All too often this method proves inaccurate and even costly.

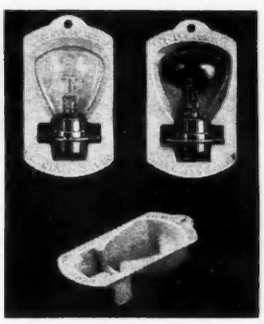
To maintain proper lighting on truck fleets is an important job. And with General Electric Safety Lighting Service equipment, it can be done quickly, accurately, and inexpensively.

All that fleet maintenance men need to service the lights on their trucks are about 25 feet of level floor space and the following equipment, available through the jobber who supplies you with G-E MAZDA Auto lamps: a G-E Adjustment Screen, as shown here, 85c; a G-E Lighting Service Kit with materials for cleaning lenses and reflectors, 45c; and a G-E Blackening Detector, a useful device that shows up blackened bulbs before they burn out, 10c.

Next time you order G-E MAZDA Auto lamps for your fleet, order this G-E Safety Lighting Service equipment . . . it costs only $1.40 complete.



The lighting service department need take up no otherwise useful space. By utilizing the pulley and cable system, the G-E Adjustment Screen and Lighting Service Kit may be hoisted to ceiling, as shown in photo, or dropped to floor as shown in sketch.



(*Above*) G-E Lighting Service Kit contains reflector cleaning fluid, cotton to apply and remove cleaner, and a screw driver.

(*Right*) Blackened bulbs are contrasted with white background of G-E Blackening Detector. Sells for 10c.

FREE 20 PAGE MANUAL WITH 100 ILLUSTRATIONS

This 11" x 14" booklet, "Safety Lighting Service Manual" tells how to install bulbs, how to adjust and service headlamps, and gives other worthwhile information. Write General Electric Co., Dept. 166-CC, Nela Park, Cleveland, Ohio. State number of trucks operated.

GENERAL ELECTRIC

MAZDA AUTO LAMPS

They stay brighter longer

When writing to advertisers please mention Commercial Car Journal

SHOWCASE

(Continued From Page 61)

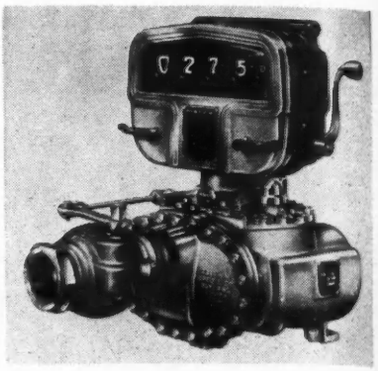
than one micron. And just as a matter of record, one micron equals 0.00003937 in. These particles are so minute they are said to border on true solution (like sugar in coffee, salt in sea water) yet retain all of the inherent qualities of solid graphite. For the full story of this most interesting lubricant, write Acheson Colloids Corp., Port Huron, Mich.

Odorless Gunk

Hydralene, an odorless degreasing and cleaning compound just introduced by the makers of Gunk, has been designed primarily for dairy, bakery and other fleets where the strong phenolic odors of ordinary compounds might be objectionable. Hydralene is soluble in kerosene and other petroleum distillates. It will sell at a slightly higher price than standard Gunk which will be continued. For further details write the Curran Corp., Malden, Mass.

Meter Prints Oil Receipts

Fuel oil delivery fleets will be interested in a new Brodie meter which combines a shock-proof printing mechanism for tabulating delivery receipts. One of the most interesting features of the device, known as the Brodimatic Printer, is the fact that it does not slow down delivery speeds. This is due to the fact that the printer is operated entirely by a hand lever (at the time total is to be recorded) and does not take its power from the meter. It is so versatile that several commodities may be imprinted on the same receipt. Further details may be had from the Ralph N. Brodie Co., 951 61st St., Oakland, Calif.



STOP GAS LOSSES!

NOW—Every drop of Gas Consumed by your motor vehicles can be accounted for QUICKLY — ACCURATELY — SAFELY!

EQUIP YOUR FLEET WITH

THE DAYTON

FUELOMETER

You've needed it—You have been waiting for it. A compact, efficient, precision meter—attached to any truck or car on the inside or outside of the cowl — that is sealed against tampering — makes gas theft impossible — prevents dishonesty and provides quick, accurate information for owners and accounting departments.

No more groping in the dark on gas purchasing, consumption, employee honesty or efficiency.

A factory seal on every meter to safeguard against tampering — and to complete our guarantee.

Now you CAN have positive gas protection.

WRITE TODAY FOR FURTHER DETAILS. — YOU WILL PROFIT BY IT.

DAYTON

FUELOMETER CORP.

DAYTON, OHIO

DAYTON

FUELOMETER

- √ A COMPACT, STURDY, PRECISION FUEL METER.
- √ ACCURATE TO ONE-HUNDREDTH PART OF A GALLON.
- √ ALL SOLID, NON-CORROSIVE BRONZE AND BRASS CONSTRUCTION.
- √ TAMPER-PROOF, FOOL-PROOF, SEALED AGAINST TROUBLE.
- √ NEEDS NO SERVICING OR ADJUSTMENT.

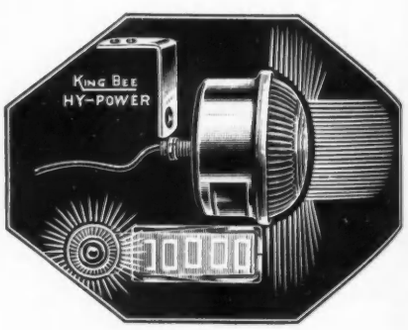
GUARANTEED.

King Bee Lamps & Mirrors

A new high-power fog lamp of exceptional intensity leads a long list of important new developments in the King Bee line. Of modernistic design, the lamp is 7½ in. in diameter, has a pre-focused 32 c.p. bulb, and has an output of 40,000 candlepower per pair. Chrome plated and complete with theft-proof mount for modern cars and trucks.

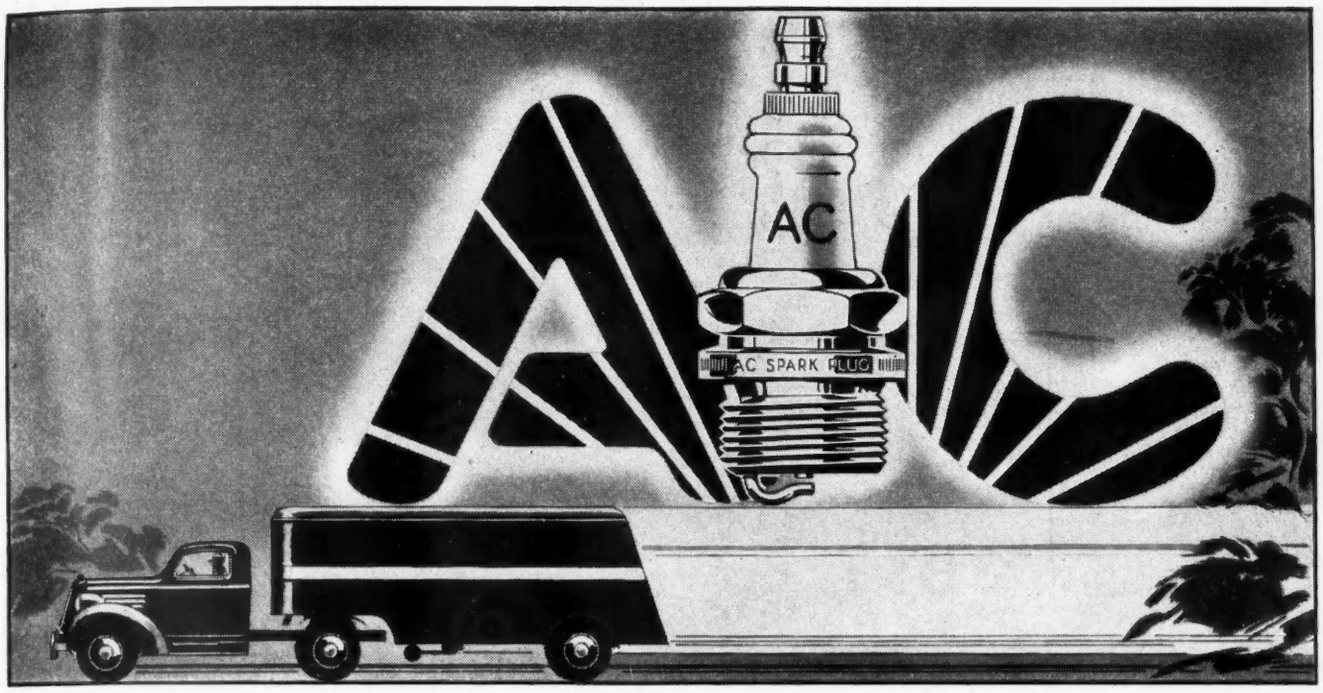
A new flush-type clearance lamp and a combination stop and tail light are also in the line. Each is fitted with a patented hi-power lens which project rays in all directions.

And still another addition is a series of



truck mirrors featuring patented rubber rims with special inner-gripping grooves to form a clutch-hold on mirror glass when stretched over the T-shaped metal rim. Completely weatherproof and extremely resistant to shock, the mirrors are available for fender or hinge mount. For full details on any of the new King Bee products, address American Automatic Devices Co., Harrison and Troop Sts., Chicago.

(Turn To Page 126, Please)



FEWER SCHEDULE BREAKS

WITH THE *Right* PLUG TYPE AND HEAT RANGE

Users of AC Spark Plugs get more reliability—consistently—because the AC line is so complete and so exactly engineered that *every engine and operating requirement can be fully met.*

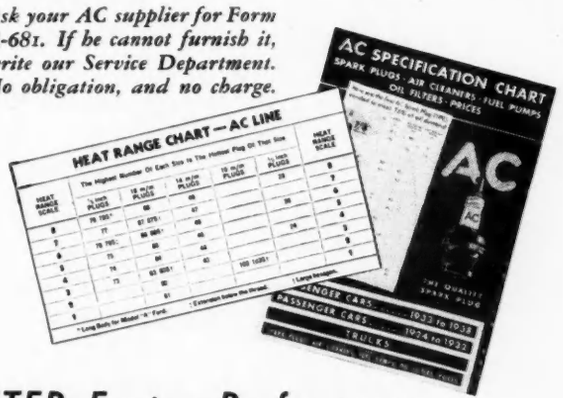
THE RIGHT TYPE—There isn't an engine built for which there isn't an AC type that has been selected not only by AC but also by the engine manufacturer. Such selection assures spark plug buyers that the specified AC type will give best satisfaction and reliability under all but abnormal operating conditions.

THE RIGHT HEAT RANGE—For those rare cases in which engine operating conditions depart from normal, the AC line offers an additional assurance of plug reliability. If preignition, rapid electrode wear, lower insulator breakage, or blow-by are encountered, AC's unique Heat Range permits selection of the "cooler" plug which will eliminate those difficulties. Similarly, if chronic sooting is experienced, this same Heat Range permits selection of the "hotter" plug which is needed.

Manifestly, the spark plugs which deliver maximum reliability are the plugs which hold schedule interruptions to the minimum. *And that, according to thousands of truck and coach operators, is exactly what AC Quality Spark Plugs do!*

Check your plug equipment WITH THE FREE AC Specification and Heat Range Charts

Ask your AC supplier for Form A-681. If he cannot furnish it, write our Service Department. No obligation, and no charge.



Use AC Spark Plugs for ***BETTER*** *Engine Performance*

AC SPARK PLUG DIVISION · *General Motors Corporation*
FLINT, MICHIGAN

SHOWCASE

(CONTINUED FROM PAGE 124)

Sponge Rubber Weather-strip

A new weather-strip material consists of a woven spring wire fabric molded into a sponge rubber rod, and the entire assembly coated with rubber film in any desired color. The wire mesh fabric projects fin-like from the soft rod providing convenient tacking space and spring tension to hold the strip in place. It stops rattles and is impervious to water. Bridgeport Fabrics, Inc., Bridgeport, Conn., has a sample waiting.

Multiple Coverage Sets

Of interest to the mixed fleet operator is Gatke's new multiple coverage brake

lining set. This type set is designed to reline a considerable number of different truck and trailer models, with a very small stock. This is accomplished largely by trimming the ends of the brake liner sets. A new catalog fully describing these sets is available from the Gatke Corp., 228 N. LaSalle St., Chicago, Ill.

LOWEST COST

LONGEST SERVICE

GREATEST SAFETY

with Gatke

Genuine CUSTOM-BILT Sets

Genuine Custom-Bilt Duo-Coe Brake Set

Heavy Duty Brake Blocks all Types and Sizes

LUG TYPE Bolt on Genuine Moulded BRAKE BLOCKS

Gatke Heavy Duty Woven Brake Lining

● Because each set has been scientifically engineered and designed to meet the highest standard of Safety—yet give the utmost in Mileage—with a Minimum Investment.

• • • • • There is a — — GATKE CUSTOM-BILT Set for Every Make—Year and Model of Motor Vehicle.

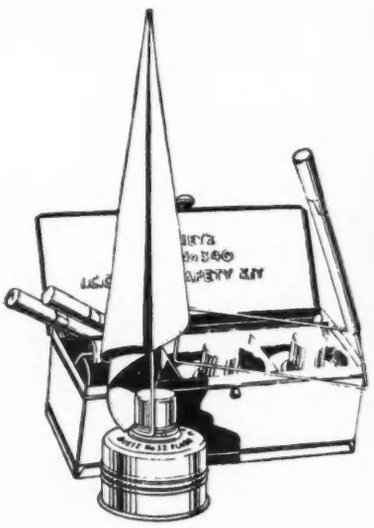
Ask your GATKE Jobber or WRITE

GATKE CORPORATION

228 N. La Salle St. Gatke QUALITY Chicago, Ill.

Heavy-Gage Flare Kit

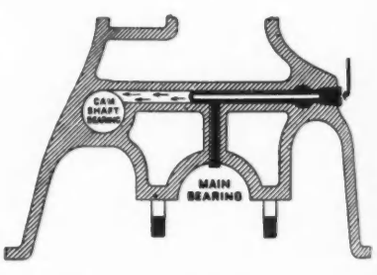
A new Dietz safety flare kit, constructed of unusually heavy (18-gage) steel, bears the approval not only of the Interstate Commerce Commission but also of the



Underwriters' Laboratories, Inc. Contents includes three No. 32 Dietz flares with stormproof burners and snuffer caps, two flags and staffs, three 15-minute fusees and two fuzee holders. The company continues to offer a lower-priced kit constructed of 22-gage metal. Full details will be rushed from R. E. Dietz Co., 60 Laight St., New York.

Oil Pressure Regulator

An oil pressure regulator designed to compensate for oil loss through worn camshaft bearings and applicable to all Chrysler built cars and trucks has been introduced by the Thexton Mfg. Co., Inc.,



313 Third Ave. So., Minneapolis, Minn. The device consists of a specially-designed metering pin which partially restricts flow to the camshaft bearing. It replaces the plug on each main bearing. Full details are available from the manufacturer.

High-Speed Take-Offs

The H. S. Watson Co., 1145 Harrison St. San Francisco, Cal., has two new power take-offs that operate at greater than en-

(TURN TO PAGE 130, PLEASE)

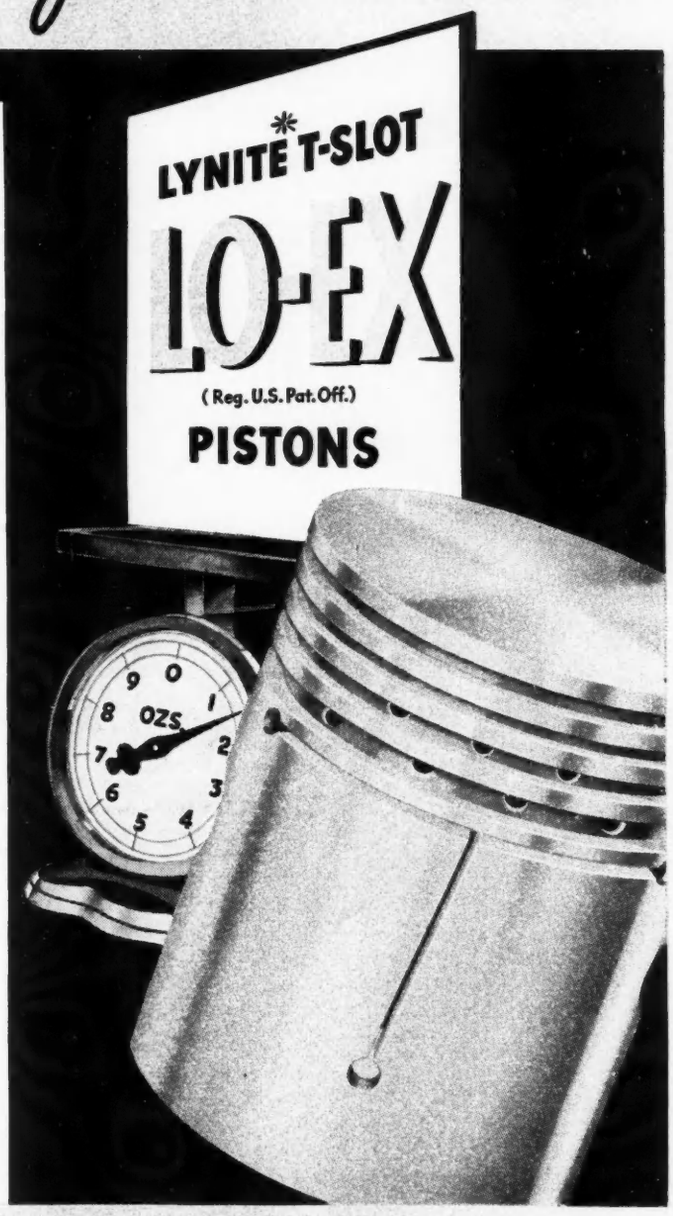
THE WEIGHT THEY MAKES A *power-ful* DIFFERENCE

Car owners are better satisfied with engine overhauling jobs when worn pistons are replaced with Lynite-T-Slot LO-EX Pistons. Lasting improvement in performance is assured. The lighter weight of these pistons means lower bearing pressures; bearings last longer.

Lynite T-Slot LO-EX Pistons offer these additional advantages: They have low coefficient of expansion, permit close clearances, provide maximum heat flow, and stand up under high compression. Oil and gas consumption, and carbon formation, are held to a minimum.

ALUMINUM COMPANY OF AMERICA,
1916 Gulf Building, Pittsburgh, Pa.

**Reg. T. M. Aluminum Company of America*



LYNITE LO-EX PISTONS—A PRODUCT OF

ALCOA · ALUMINUM

CAST ONLY BY ALUMINUM COMPANY OF AMERICA

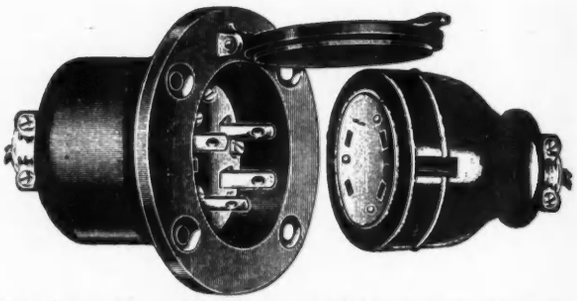
When writing to advertisers please mention Commercial Car Journal

SHOWCASE

(CONTINUED FROM PAGE 126)

gine speed. The model W for heavy duty is rated at 9 h.p. at 500 r.p.m. and 27 h.p. at 1500 r.p.m. The model SW for driving small high-speed pumps is rated at 3 h.p. at 500 r.p.m. and 9 h.p. at 1500 r.p.m. Both models have needle bearings on the take-off shaft and the heavier one has roller bearings on the intermediate shaft while the SW has needle bearings in this location. The high speed of the take-off shaft permits straight line driving and direct connection with the pump. This eliminates the necessity of step gears or chains.

Trailer Connector

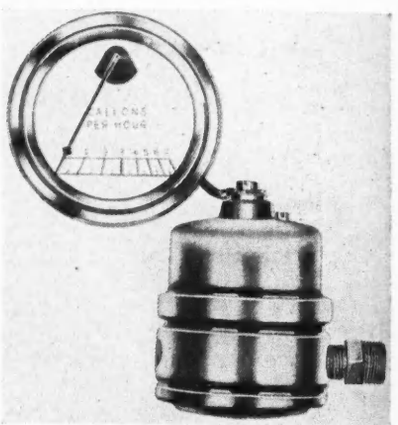


A full line of Packard electric connectors, cables and accessories for tractor trailer installations is now available. Illustrated is the complete jumper connection with malleable iron mounting box with hinge cover and micarta plug carry required number of male leads and a rubber connector plug carrying female contacts. Models are available for deep or shallow mounting or for no mounting at all.

An informative leaflet, F 23-A, describes the full line and gives some practical suggestions on proper application as well as convenient chart showing cable sizes required. Write for your copy. The Packard Electric Division of General Motors, Warren, Ohio.

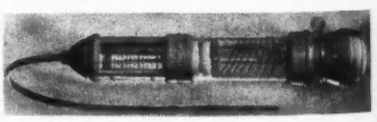
"Mile-O-Meter"

The Mile-O-Meter Corp., Michigan City, Ind., is producing a gage that gives a reading of fuel consumed in gallons per hour. A dial unit graduated from 0 to 7 gal. is mounted on the instrument board and the measuring unit is connected into the fuel line between the fuel pump and the carburetor. The gage indicates the number of gallons of gasoline being consumed per hour at any speed so that the most economical speed can be determined. It will likewise detect any let-down in engine performance due to any cause. The gage is electrical, requiring less than ¼ amp. to operate. The price $7.95. A larger model has readings to 12 gal. per hour.



Anti-Freeze Helpers

A new direct reading hydrometer for use with Nor'way anti-freeze as well as an intriguing calculator for speedy figuring of anti-freeze requirements has been introduced by the Commercial Solvents Corp., 230 Park Ave., New York. Fleetmen may get full details on how to secure either of these items by addressing the manufacturer.



(TURN TO PAGE 134, PLEASE)

NOTE—NO MOTOR VEHICLE "GOVERNOR" IS SAFE IF IT DOES NOT PROVIDE

THE HIGHEST FACTOR OF SAFETY FOR PASSING AND FOR OTHER EMERGENCIES

New and Revolutionary in Performance

THE THREE "A" GOVERNOR

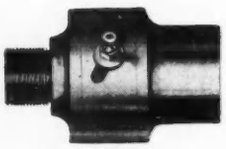
Auto-Accurate-Action-As Accurate as Your Speedometer

TIMED AND SET AT A PREDETERMINED SPEED WITH THE SPEEDOMETER, it eliminates the HUMAN ELEMENT and definitely solves the SPEED PROBLEM for it provides the highest factors of safety for passing another vehicle, since, after the THREE "A" GOVERNOR functions, any speed necessary for passing is obtainable for a distance of 600 to 800 ft. The speed of the vehicle then immediately returns to its predetermined setting.

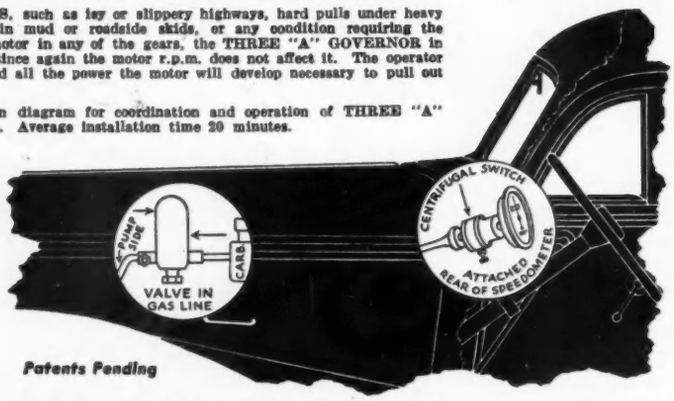
It is controlled by the speedometer mechanism, hence not influenced through the changing of gears or a change in motor r.p.m. Thus it permits the vehicle to climb hills with ease up to the maximum predetermined speed setting (with the above mentioned passing feature still available). This marvelously aids in CLEARING CONGESTED HIGHWAYS in mountainous or hilly districts.

In EMERGENCIES, such as icy or slippery highways, hard pulls under heavy loads, difficulties in mud or roadside skids, or any condition requiring the full power of the motor in any of the gears, the THREE "A" GOVERNOR in no way interferes since again the motor r.p.m. does not affect it. The operator has at his command all the power the motor will develop necessary to pull out of tight places.

Observe installation diagram for coordination and operation of THREE "A" GOVERNOR parts. Average installation time 20 minutes.



Centrifugal Adjustable Switch



Patents Pending

The warning light on instrument panel informs operator when Governor functions, an increased safety factor.

The THREE "A" GOVERNOR, through its many economies and safety features, pays for itself many times over throughout the year and is in reality an insurance policy against speeding.

After speed is reduced to the predetermined setting, the motor's response is immediate and smooth. Three years of actual road work definitely proves the theory of the THREE "A" GOVERNOR.

PRICED at $9.75 F.O.B. factory

SPEED WARNING SIGNAL

For those interested only in a warning signal, the THREE "A" SYSTEM consisting of centrifugal electric switch and warning light presents the most efficient and accurate warning device on the market.

PRICED at $4.75 F.O.B. factory

Ask your automobile dealer for demonstration.

NOTE: Fleet owners, our representative will equip one of your automobiles or trucks for demonstration without obligation to you.

Manufactured by F. W. Stewart Mfg. Corp., for

SCIENTIFC RESEARCH, INCORPORATED

Trust Building **Williamsport, Pa.**

Write us for complete descriptive literature.

Electro Magnetic Gasoline Valve

TRADE MARK

Cut Chain Costs by more than *Doubling* SAFE Mileage

● The same feature that makes WEED Americans *wear* more than twice as long also makes them the *safer* chains. That is the double-welded Bar-Reinforcement. It provides twice the metal to wear through—and grips the road *three ways*, stopping forward, back and side skids.

WEED Americans are made of "Weedalloy"—a tough, wear-resisting metal especially developed for WEED tire chains. Side chain links are welded and hardened to take the punishment of curbs and ruts. Patented Lever-Lock End Hooks make WEED Americans easy to put on and remove.

Standardize on WEED American Bar-Reinforced Tire Chains and save on tire chain costs.

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT, CONNECTICUT

SEND FOR FREE CHART

25% to 50% can be added to chain mileage by proper installation. Send for free chart that shows how to apply chains so that all cross chains get equal wear.

In Business for Your Safety

ACCO

WEED

WEED American *Bar-Reinforced* TIRE CHAINS

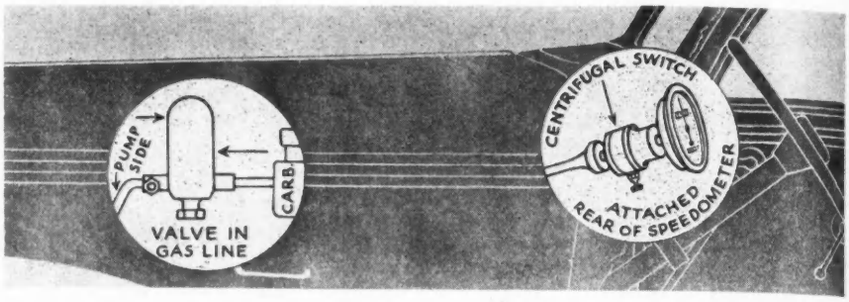
Licensed to manufacture and sell Bar-Reinforced Tire Chains under United States and Canadian Letters Patent: American Chain & Cable Company, Inc.; The McKay Company; The Hodell Chain Company; Pyrene Manufacturing Company; Dominion Chain Company, Limited; and Pyrene Manufacturing Company of Canada, Limited.

SHOWCASE

(CONTINUED FROM PAGE 130)

Three A Speed Control

A new governor speed regulating device incorporating a centrifugal switch at the speedometer and an electro magnetic switch to restrict gasoline flow will soon be available under the name of the "Three A Governor". An important feature is the fact that there is absolutely no governing action until the predetermined speed of the vehicle is reached regardless of the gear used. Thus full engine output is available up to the governed point. A dash-mounted warning signal may be installed in conjunction with the device. Full specifications and details may be secured from Scientific Research Inc., Trust Building, Williamsport, Pa.



Now GRIGSBY IGNITION

- 9 to 15 Percent Lower Fuel Cost
- Quick Starting—Instant Full Power in Cold Weather
- Increased Acceleration, Power and Speed
- Reduced Burning of Breaker Points
- Use of Lower Grade Gasoline
- No Fouled Spark Plugs; Long Plug Life

at new low prices

● Now the advantages of the Grigsby *Ultra-High-Frequency* Ignition Coil are available—at no more than the cost of ordinary coils! Neither a regular nor a "hot" coil, its unique circuit produces an *alternating ignition current* of longer duration . . . provides more complete combustion. Seven models—for maximum efficiency on every engine in every r.p.m. range.

See your Grigsby jobber, or write for complete information.

ELSBERT MANUFACTURING COMPANY
353 W. GRAND AVE.
CHICAGO

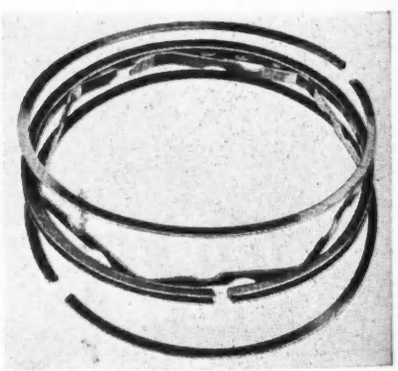
GRIGSBY
ULTRA HIGH FREQUENCY
IGNITION COIL

Yankee Turn Master

Yankee Turn Master is the latest offering of Yankee Metal Products Corp., Norwalk, Conn. It is a complete passenger car directional signal outfit with indicating steering column switch and furnished with front and rear or rear only combination arrow lights. Full details will be supplied by the manufacturer.

New Ring for Tough Jobs

American Hammered has developed a new all-steel piston ring, known as "Steel-Edge," for use in jobs which frankly should be but sometimes are not rebored. jobs with taper above .015 in. Said to be the only all-steel, 4-piece ring on the market with a ventilated spacer, it consists of



two rims, a channelled spacer and an expander.

For cylinders up to .015 in. taper the company still recommends its Flexible Oilcutter, and for rebores, the conventional Oilcutter. Fleetmen desiring information about any or all these lines should write the American Hammered Piston Ring Division, Koppers Co., Baltimore, Md.

(TURN TO PAGE 138, PLEASE)

WALTER

FOUR-POINT POSITIVE DRIVE

will see you through

SMASHING through heavy snowdrifts, hauling twenty-five-ton trailers in coal-stripping operations, carrying enormous logs over sketchy forest roads, transporting big loads of pipe across country in the oil fields—these are just a few of the hard jobs that Walter Tractor Trucks and Snow Fighters take as daily fare.

The remarkable records established by Walter Trucks in getting through—no matter what the odds against them—are chiefly due to a patented feature possessed by no other vehicles. We mean Walter Automatic Lock Differential, providing Four-Point Positive Drive. Many trucks have "four-wheel drive", of course. Only the Walter, however, has *Four-Point Positive Drive,* insuring full power on all wheels under all conditions.

If one wheel spins on a slippery surface, its mate does not lie dead, but continues to exert full pulling power. It would be necessary, therefore, to slip all four wheels to stall a Walter, instead of merely one front and one rear wheel, as in ordinary four-wheel drive.

Write today for complete information on Walter Trucks and Snow Fighters

WALTER MOTOR TRUCK CO.

1001-19 IRVING AVE., RIDGEWOOD, QUEENS, LONG ISLAND, N. Y.

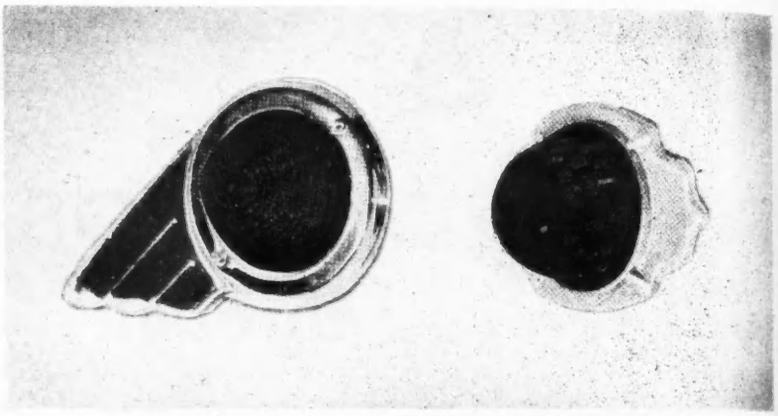
When writing to advertisers please mention Commercial Car Journal

SHOWCASE

(CONTINUED FROM PAGE 134)

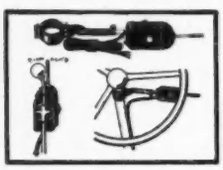
New Vapor Cleaner

Combining the principles of soap washing and vapor cleaning, a new Magnus Vapor Cleaner has been introduced for use with any type of steam or vapor cleaners. Unusual cutting properties are reported. It is available in two grades, Magnus 92-E for light duty, Magnus 94-E for heavy duty cleaning. A new descriptive folder is ready. Address the Magnus Chemical Co., Inc., Garwood, N. J.



Announcing The TURN-LITE

The Dependable Direction Signal with *Universal Switch*



You'll be safe with this new, easy to operate direction signal. Available with mountings to fit all trucks and buses. Features a new compact switch with finger tip control that may be mounted either on the steering post or gear shift lever Easy to install. Five models for all types of installations.

and this GIANT-LITE

– *the light that shouts*

You need this stoplite that is large enough to be SEEN. Seven inch lens is easily visible at 1000 feet. Available with flush mounting or angle bracket. White lens also available for use as brilliant back-up light.

Ask your jobber or write

DO-RAY LAMP COMPANY

1458 S. Michigan Avenue

CHICAGO, ILL.

Flares (Electric and Oil) • Tiger-Ey and Nobby Reflex Devices • Foglites • Stop and Tail Lamps and Specialties

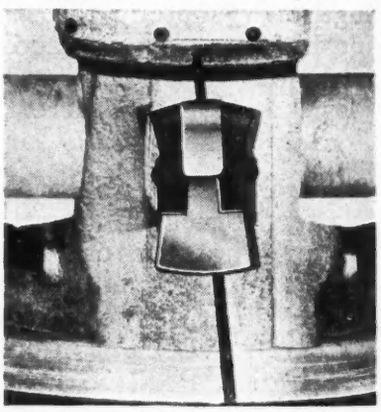
Royal Norton Additions

Newest in the Royal Norton line of lamps are the flush-type marker lamps illustrated. The wing portion of the new model 900 (left) is flexible for corner mounting and of course may be had in either right or left types. There is also new series of streamlined marker lights with bodies up to 9 in. for ultra modern vehicles.

A new Royal extension mirror is also available with either hinge or flat-base mounting, a 5 in. non-glare glass, and a pull out range from 15 to 23 in. For complete details of both lines, write Monroe Acme Co., 2106 South Kedzie Ave., Chicago.

Wedge-type Piston Expander

A new Sunnen adjustable wedge-type piston expander can be used with any type piston to expand it any reasonable amount desired. Installation is simple. Two holes are drilled in the piston, the

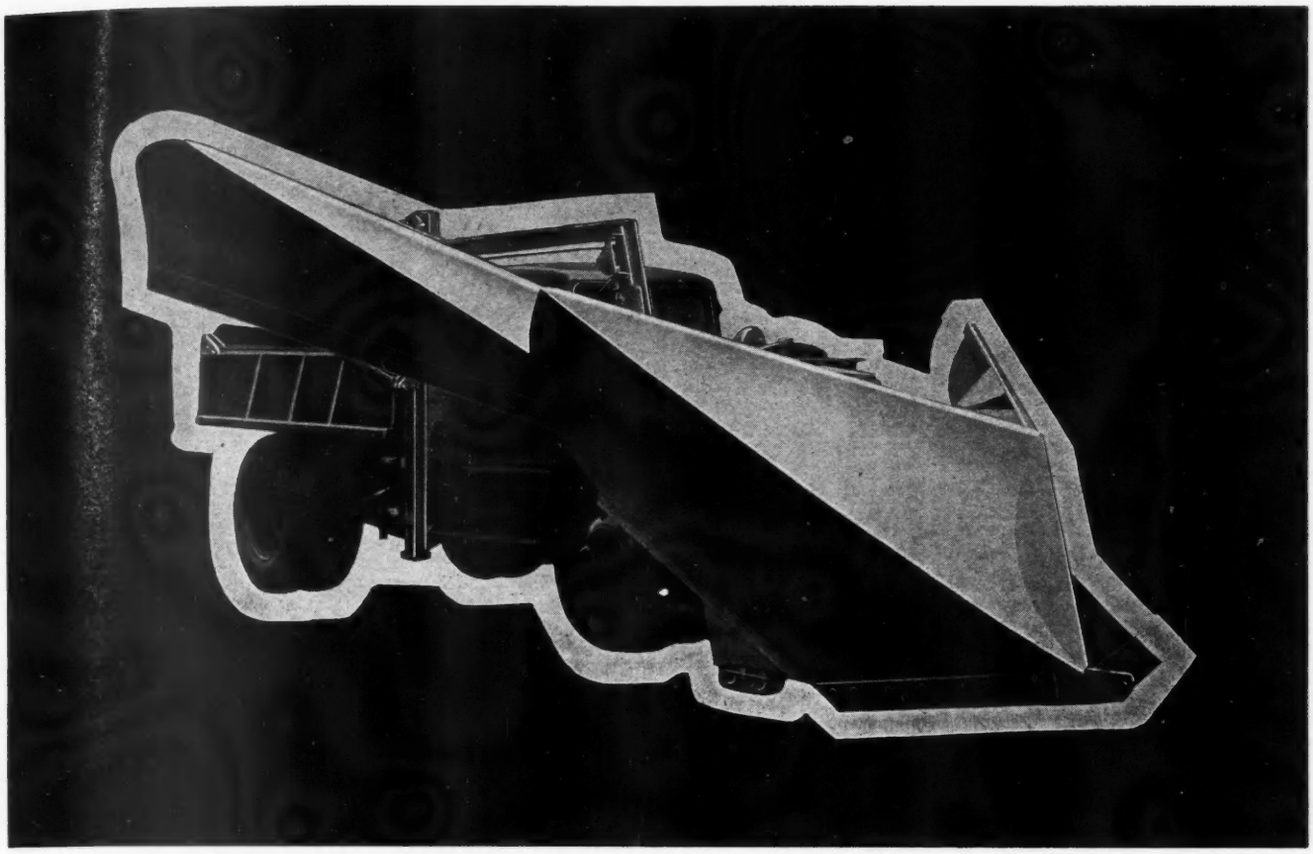


wedge inserted with pliers, driven in to the point of expansion desired and locked. Outwardly flared prongs keep the expander snug against the piston. Made of hardened spring steel, the device permits sufficient flexing action of the piston, yet holds it to the desired size. Full details may be procured from Sunnen Products Co., 7917 Manchaster Ave., St. Louis, Mo.

New Body Material

Carstenite, a panel material consisting of real wood in the form of thin veneer 1/60 in. or thinner, resin bonded, under heat and pressure, to Masonite, is a new product on the market which should find many uses in the transportation field.

(TURN TO PAGE 142, PLEASE)



For SNOW PLOWS . . . . consult "GOOD ROADS"

Thirty-five standard models of Good Roads Champion Snow Plows are available for attachment to your truck, whether it is of 1½-ton size or the largest truck built.

For twenty-seven years, "Good Roads" have been making snow plows for use on motor trucks. During that time they have developed the most complete line of snow plows in the world.

In addition to making plows of all sizes to fit all makes and models of trucks, "Good Roads" builds plows in a variety of types to meet all plowing conditions. Reversible blade plows with the famous Good Roads Automatic Safety Blade Trip; the widely used "Highway Special" tripping one-way plow; powerful V-type plows with full power-hydraulically operated wings; and many other types for trucks and wheel tractors are being made at the "Good Roads" factory.

Seven models of material spreaders for combatting the dangers of sleet and ice are also made by "Good Roads." They are attachable to any truck.

The complete line of Good Roads Champion Snow Plows and Spreaders is fully illustrated and described in two attractive catalogs. The catalogs are yours for the asking. Just send a card to Dept. A, Good Roads Machinery Corp., Kennett Square, Pa.

GOOD ROADS CHAMPION SNOW PLOWS

When writing to advertisers please mention Commercial Car Journal

SHOWCASE

(CONTINUED FROM PAGE 138)

Faced with light woods, such as birch, maple, poplar, capomo, prima vera and avodire, Carstenite can be used for the de luxe type of delivery body when the body is built with natural wood panels.

Carstenite is practically the same weight as plywood. It is put out by Carstenite Sales, 228 N. La Salle St., Chicago.

The company also contemplates the introduction of a metal-covered body panel known as "MasonMetl," which will consist of stretcher leveled sheet steel glued to Masonite or Tempered Presswood.

Air Compressor Filter

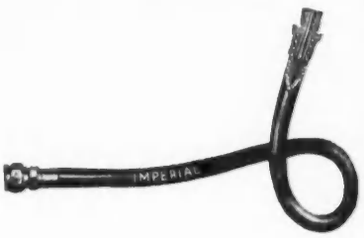
Because air compressors on modern vehicles are usually installed where dust conditions cannot be avoided, an air filter is vital in preventing premature wear. To meet this condition, the new Air-Maze oil bath filter for use with any type compressor has been designed. Known as the BX assembly, it comes complete with universal mounting bracket. High cleaning efficiency, extremely low restriction and easy servicing are advantages claimed. An integral relief valve permits compressors to "unload" through the filter without disturbing oil content. Details from Air-Maze Corp., 5200 Harvard Ave., Cleveland, Ohio.

Headlight Relay

A new headlight relay operating in much the same manner as the familiar horn relay has been introduced by P & D. Easily installed just back of the headlights, it eliminates all line and switch losses which are unavoidable in the conventional hook-up. For full details, write P & D Mfg. Co., Inc., 19-02 Steinway St., Long Island City, N. Y.

Neoprene Oil Line

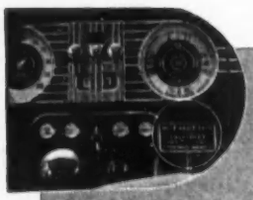
A new Imperial flexible oil line with neoprene core has been introduced to meet the needs of oil filter installations. A heavy wire interwoven fabric protects the lines, and prevents swelling or drawing



closed. The neoprene will withstand temperatures of 300 deg. for 50 continuous hours without damage, and is of course unaffected by oil. The line has a recommended working capacity of 500 lb. Complete details from the Imperial Brass Mfg. Co., 1200 W. Harrison St, Chicago.

Powerflo Piston Expander

A spring-type piston expander which slips into the slot of split-skirt or T-slot pistons and so light that a set of six weighs only half an ounce is now available under the name "Powerflo." Installation is simplified by a drill block provided with each set. Clamped across the slot it forms a template for three 5/32 in. holes. Projecting lugs on the expander fit the indentations formed by the drill and hold the expander permanently in place. Full details may be had from Ulrich Mfg. Co., Shelbyville, Ill.

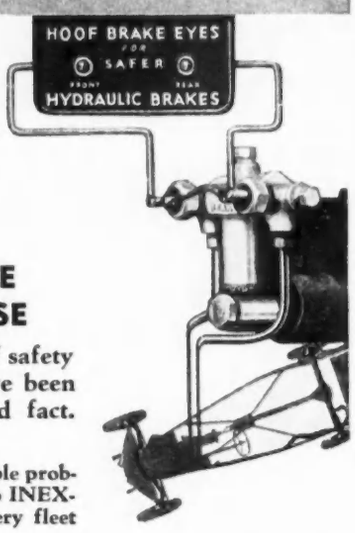


Greatest Nine Words ever written in Hydraulic Brake History

NO LONGER NEED LEAKS CAUSE COMPLETE HYDRAULIC BRAKE FAILURE

An Epoch Making Announcement that opens up a new way for fleet operators to

- **REDUCE ACCIDENT RATES**
- **CUT INSURANCE COSTS**
- **SAVE ON HYDRAULIC BRAKE AND MAINTENANCE EXPENSE**



The search is ended! That extra measure of safety for which Hydraulic Brake Engineers have been seeking for years is now an accomplished fact. Hoof Brake Eyes are the answer!

Again engineering has solved a seemingly impossible problem, solved it effectively; solved it with a device so INEXPENSIVE that the cost will be dismissed by every fleet operator as of no consequence!

NO ONE KNOWS how many accidents are caused by Brake Failure due to loss of brake fluid! Dead men tell no tales! Wrecked cars conceal the facts! But one thing is certain. Loss of brake fluid through leaks or breaks in the lines is the cause of many accidents—accidents that YOU can now prevent by the simple installation of Brake Eyes . . . on every car, bus or truck in your fleet.

Hoof Brake Eyes not only prevent total brake failure when loss of fluid occurs, but they also provide the driver with a constant check on brake condition *from the dash*. When normally operating brakes are applied, two small red "eyes" light on the dash indicator; when only one "eye" lights, the driver knows immediately that only the front or rear brakes are operating, knows that the Hoof Brake Eye mechanism attached to the hydraulic brake cylinder has sealed off the leaking brake line giving him one good set of brakes instead of NONE!

Not only is the use of Hoof Brake Eyes on your trucks, buses and cars an important step in accident prevention and an important aid in reducing insurance costs under the "experience rating plan" but is also the means of reducing maintenance costs.

An air trap, located in the top of the Hoof Brake Eyes, prevents air from getting into brake lines. A central bleeder screw located on the top of this trap makes possible the bleeding of trapped air in one simple operation.

10,000 Safety officials at NATIONAL SAFETY CONGRESS, October 10-14, see first showing and demonstration. Pronounced the greatest Safety Achievement of all time by automotive engineers, safety officials, police officials attending the Congress.

SURPRISINGLY LOW PRICED. INSTALLATION A MATTER OF MINUTES! SEND YOUR ORDER NOW. ADDRESS DEPT. BEC, 162 N. FRANKLIN ST., CHICAGO.

$10.00 List — For PASSENGER CARS and 1½ ton (or less) Trucks and Buses.

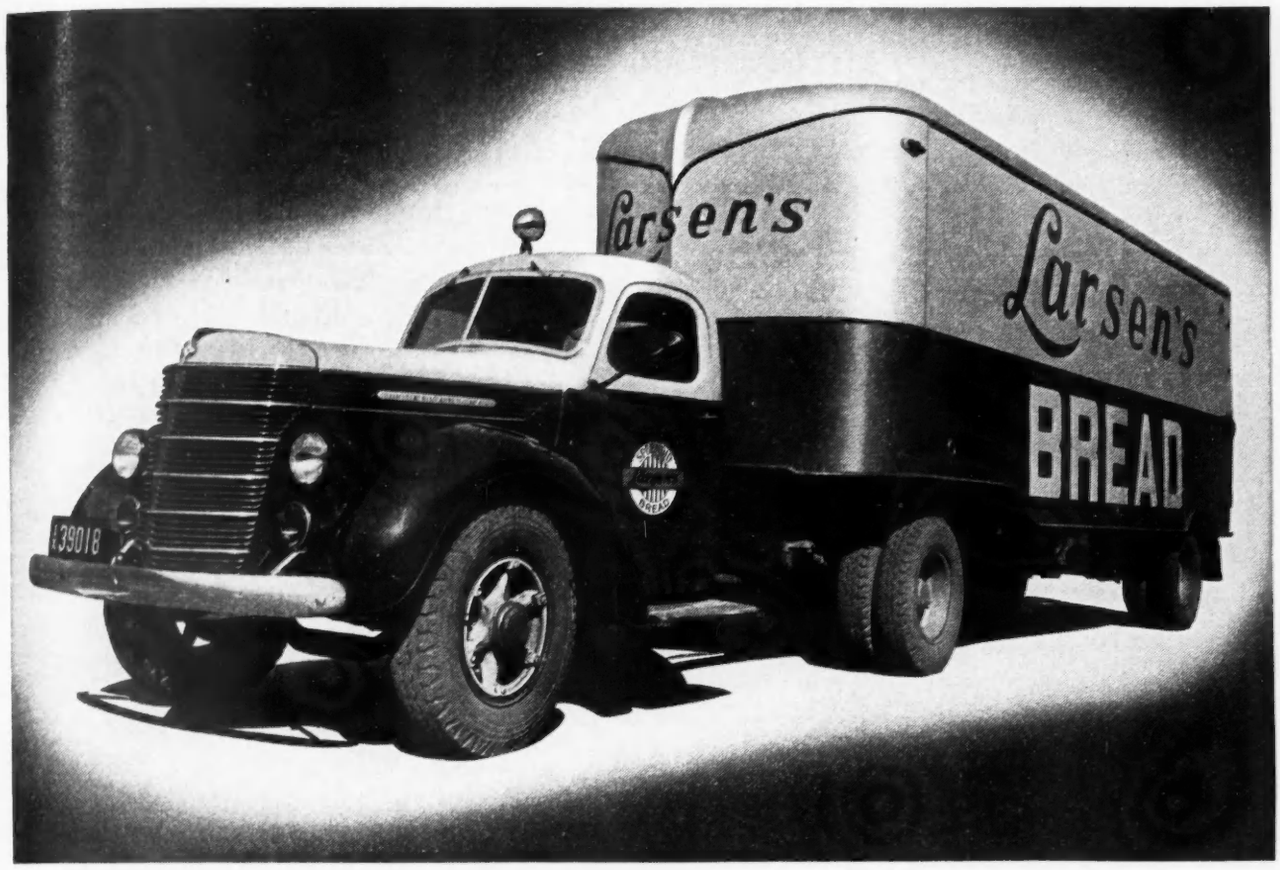
$12.50 List — and up for Heavier Trucks and Buses.

HOOF BRAKE EYES

For SAFER Hydraulic Brakes

HOOF PRODUCTS — CHICAGO, U. S. A.

IT HAULS BREAD—



AND MAKES "DOUGH"!

. . . which is one way of saying that the Sherwin-Williams Kem Transport Enamel paint job on this huge trailer truck is winning a lot of customers for Larsen's bread. Any way you figure it, lasting "beauty and protection" spells greater advertising value and lower painting costs because it means your fleet keeps on the road doing its job!

Kem Transport Enamel is a strictly modern finish developed to make your deliveries effective travelling billboards. It produces a natural, porcelain-like, lustrous finish of exceptional beauty. Its remarkably brilliant colors withstand severe exposure, and its smooth surface is easily kept sparkling and clean. Painters prefer Kem because of the fast and easy way this finish handles.

We invite you to try Kem Transport Enamel—and for help in developing attractive color schemes that identify your fleet, enhance streamlining and increase visibility, consult the S-W Transportation Color Service. No cost or obligation! Write The Sherwin-Williams Company, Cleveland, Ohio and principal cities.

SHERWIN-WILLIAMS KEM TRANSPORT ENAMELS

When writing to advertisers please mention Commercial Car Journal

COLOR SCHEMES

(CONTINUED FROM PAGE 31)

be applied to make a truck appear shorter—color schemes 2A, 2B, 2C.

3. To create an impression of warmth:

One or more of the following warm colors should predominate:

Ivory, cream, buff, tan, brown, red, orange, yellow or black—see color schemes 1B, 1C, 1D, 2A, 3A, 3B, 3C.

4. To create an impression of coolness:

One or more of the following cool colors should predominate:

Gray, green, blue and white—color schemes 1A, 2B, 2C, 4A, 4B, 4C.

5. To make a truck appear larger:

Paint in light colors—see color schemes 1A, 1B, 2B, 3B.

6. To make a truck appear smaller:

Paint in dark colors—see color schemes 1C, 1D, 2A, 2C, 3A, 3C, 4A, 4B, 4C.

To make a truck appear longer:
Color Scheme 1A

Striping, such as a wide belt which may or may not extend across the top of the hood.

Location	Color
Body, Roof and Wheels	Henbury Green
Belt, Fenders and Striping	Black
Lettering on Black Belt	Cream
Lettering on Green	Cream outlined with Black

Color Scheme 1B

Painting the roof a different color from the body color.

Location	Color
Roof	Coronado Tan
Body and Wheels	Tacoma Cream
Belt, Fenders and top of Hood	Caramel Brown
Lettering	Omaha Orange outlined with Black

Color Scheme 1C

A two-toned combination of strong contrasting colors dividing the truck into two horizontal planes.

Location	Color
Upper Body and Roof	Cabana Cream
Lower Body, Hood and Fenders	Rich Maroon
Lettering and Wheels	Oriole Orange

Color Scheme 1D

Painting the fenders and wheels a different color from the body.

Location	Color
Entire Body	Oriole Orange
Fenders, Wheels, Lettering and Striping	Black

To make a truck appear shorter:
Color Scheme 2A

Painting the hood and fenders a contrasting color.

Location	Color
Body and Roof	Teak Red
Hood, Fenders and Lettering	Black

Color Scheme 2B

Emphasizing vertical striping and and lettering.

Location	Color
Body and Roof	Cream Medium
Fenders, Hood and Wheels	Green
Lettering and Striping	Black

(TURN TO PAGE 146, PLEASE)

Only Bendix builds the

BENDIX DRIVE

. . . and only Bendix makes genuine Bendix Drive parts

"BE SURE IT'S A BENDIX"

WE ñE proud of the Bendix Drive—proud of its history of unexcelled service, proud of the faithful manner in which it functions in millions of cars and trucks every day. To protect that fine reputation, we build replacement parts that measure up by every standard. Each *genuine* part is exactly the same as that used in the original quipment drive.

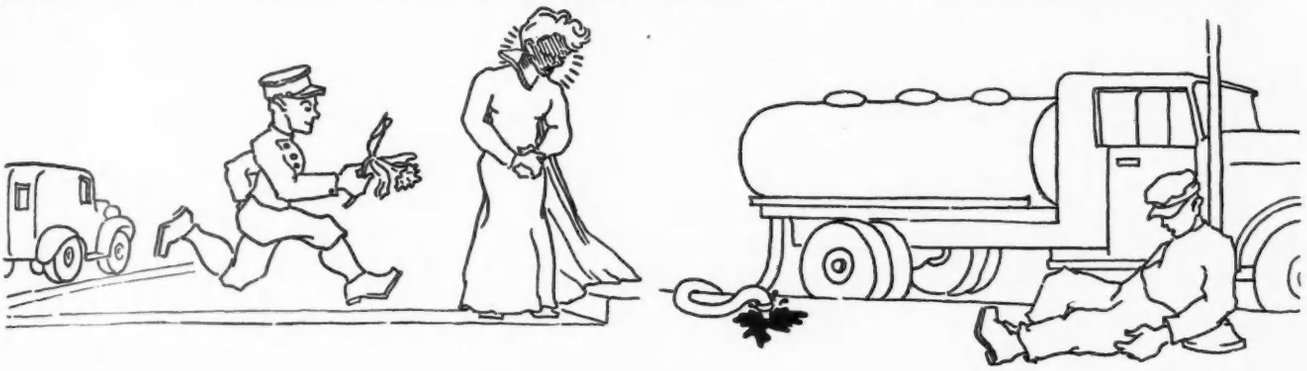
Look for the name "Bendix" stamped into every genuine part. Stubbornly refuse any substitutions. Only with genuine Bendix parts can you be sure of getting *genuine* Bendix Drive performance.

ECLIPSE MACHINE DIVISION
BENDIX AVIATION CORPORATION
ELMIRA, NEW YORK

GENUINE BENDIX DRIVE SPRINGS ARE PACKED IN BLUE BOXES PLAINLY MARKED WITH THE NAME "BENDIX" FOR YOUR PROTECTION AND CONVENIENCE.

WHETHER...

DELIVERING ORCHIDS TO A BLUSHING BRIDE... FUEL OIL..



BAKED GOODS... OR BRICKS...

UPHOLSTERY TAKES A BEATING!

REDO
UPHOLSTERY
A GOODALL-SANFORD PRODUCT

...a good reason to insist on REDO UPHOLSTERY —in new trucks or for upholstery replacements.

REDO is a stand-by with the largest truck manufacturers and fleet operators... because this rugged upholstery packs ENDURANCE, STAMINA and the ability TO TAKE PUNISHMENT in every square yard.

Write today for a test sample of REDO. **You'll see for yourself why this truck upholstery WEARS LONGER and LOOKS BETTER.**

CHASE

L. C. CHASE AND COMPANY • 295 FIFTH AVENUE • NEW YORK CITY
Selling Division of Goodall Sanford Industries
• BOSTON • DETROIT • CHICAGO • LOS ANGELES

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(CONTINUED FROM PAGE 144)

Color Scheme 2C

Large square or vertical lettering.

Location	Color
Entire Truck	Forest Green
Lettering	Carthage Yellow outlined with Black

To create an impression of warmth:

Color Scheme 3A

Location	Color
Upper Body	Enterprise Cream
Lower Body	Mohawk Maroon
Lettering	Black

Color Scheme 3B

Location	Color
Upper Body, Roof and Top of Hood	White
Lower Body, Sides of Hood, Fenders and Wheels	Warrior Red
Lettering and Strip.	Black

Color Scheme 3C

Location	Color
Upper Body	Cheruit Vermilion
Lower Body	Mohawk Maroon
Lettering	Cream outlined in Black

To create an impression of coolness:

Location	Color
Upper Body	Croydon Cream
Lower Body	Grass Green
Lettering and Striping	Black

Color Scheme 4B

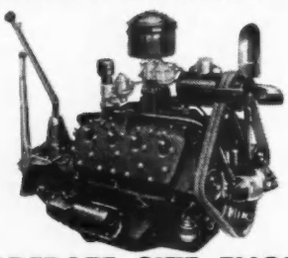
Location	Color
Upper Body	Henbury Green
Lower Body	Green
Lettering	Cream outlined with Black

Color Scheme 4C

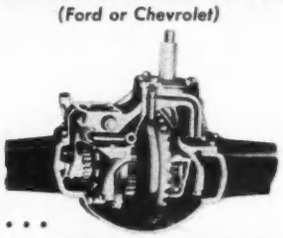
Location	Color
Upper Body	Rarlham Cream
Lower Body	Boatswain Blue
Lettering and Striping	Warrior Red

TRUCKSTELL CONVERSIONS

OF FORD AND CHEVROLET TRUCKS ARE MANUFACTURED FROM WELL BALANCED GROUPS OF PROVED CAPACITY UNITS

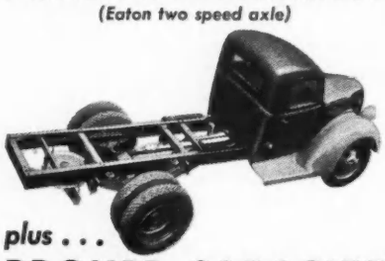


MODERATE SIZE ENGINE
(Ford or Chevrolet)



plus . . .

DUAL PERFORMANCE
(Eaton two speed axle)



plus . . .

PROVED CAPACITY
Conversion parts used in balanced groups.

equals . . .

TRUCKSTELL

which means high ratio of pay load to truck weight; low fuel and oil costs; broad availability of service and low unit exchange prices; more profitable speed over hills and level roads.

ENGINEERED INTO FORD AND CHEVROLET TRUCKS

Complete specifications as to size, material, design and installation for every conversion part used in any given model are fixed upon by Truckstell engineers through exhaustive laboratory and operating tests.

Upwards of thirty manufacturers located in principal cities work to these rigid Truckstell specifications so that each Truckstell, no matter where built, is a PERFECTLY BALANCED unit of certified capacity.

Larger operating profits result from the big payload capacity, the greater economy and superior performance of a moderate size engine used in combination with Eaton TWO SPEED AXLES of various capacities. Satisfied owners testify that the well known economies in operation and maintenance of Ford and Chevrolet power plants are preserved and even enhanced in Truckstell Conversions.

Truckstell Conversions cost less to buy than any other truck of equal rated capacity.

MODELS:

400; rated capacity, 3 to 4 tons; gross, 14,500 pounds.

500; rated capacity, 2½ to 5 tons; gross, 16,000 pounds.

600; rated capacity, 3½ to 6 tons; gross, 18,500 pounds.

2X-400 Ten Wheeler; rated capacity 3½ to 7 tons; gross, 24,000 pounds.

Truckstell Conversions of Ford and Chevrolet trucks can be equipped to handle up to 24,000 pounds as a truck; 40,000 pounds as a tractor. Wheelbases up to 217 inches.

See your local dealer or write

TRUCKSTELL INCORPORATED

140th and Darley Ave. Cleveland, Ohio

TRUCKSTELL

Engineering

FORECAST

(CONTINUED FROM PAGE 23)

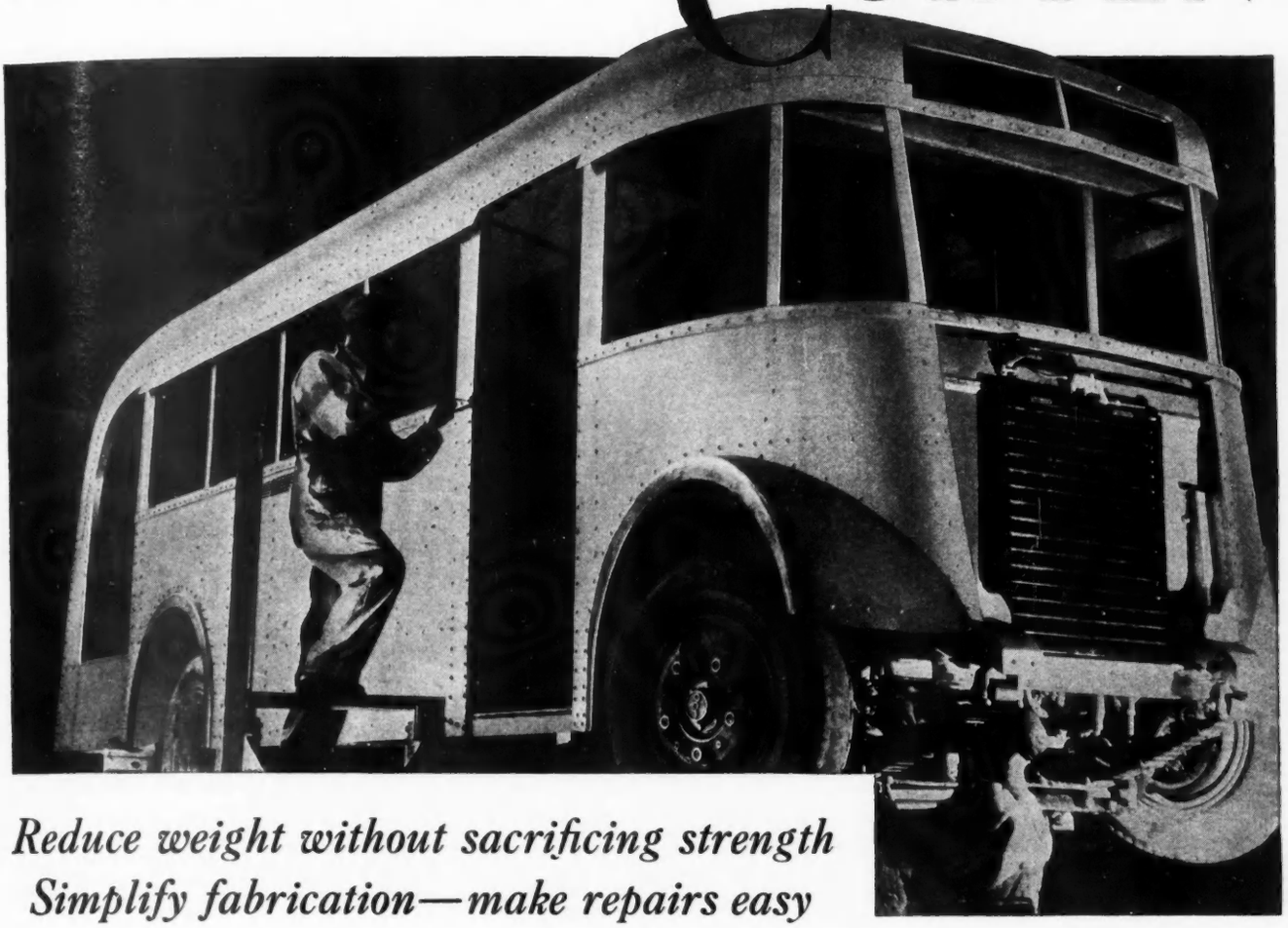
specialized types will be prepared for certain particular applications. Differing from this opinion is an idea expressed that truck manufacturers are already called upon to furnish various sizes of engines, different kinds of transmissions and various kinds of axles in the same chassis and that this should satisfy the demand for specialization

Transmissions are the subject of varied speculation. A box score of the opinions at hand indicates that two engineers look for radical change resulting in automatic or semi-automatic operation. Two more will settle for some form of constant mesh gears for easier, quicker shifting for all sizes of trucks and two do not see much change ahead. Another opinion is that "there is no doubt but what we are in an era when modifications and changes of this unit are being given careful thought but that controls will pass through a period of experimentation and modification before any radical changes are made in the unit itself. This has been the apparent course in the passenger car field first; the bus field second; and will probably be reflected in the truck field."

One of the proponents of the clutch-gear-shifted transmissions says, "It is doubtful if power shifting or automatic shifting of present transmissions offer advantages commensurate with their additional cost, complications and their decreased

(TURN TO PAGE 148, PLEASE)

BUILD LIGHT WITH COR-TEN



Reduce weight without sacrificing strength
Simplify fabrication—make repairs easy

IN hundreds of buses, in trucks, and in lightweight bodies of all kinds, COR-TEN, the pioneer low-alloy, high tensile steel has demonstrated its ability to reduce parasite poundage without sacrificing strength or durability.

Because it has a yield point almost twice that of mild steel—because it has 4 to 6 times the resistance to atmospheric corrosion, COR-TEN can be used with perfect safety in lighter sections to give weight reductions of from 20 to 40%.

COR-TEN is inexpensive to use. A tonnage grade steel, COR-TEN's cost per pound is so close to that of ordinary steel that in many applications COR-TEN construction actually costs no more per unit of strength.

Because COR-TEN is ductile as well as strong—has working and forming qualities comparable to those of plain steel, it can be fabricated by the usual shop methods. This fact is important and especially so to the user of COR-TEN equipment. It means that when accidents occur, repairs can be made, quickly and easily. Repair crews are working with a material with which they are thoroughly familiar—COR-TEN *steel* which forms, welds and rivets like ordinary steel.

To find out how U·S·S High Tensile Steels — U·S·S COR-TEN, U·S·S MAN-TEN and U·S·S Stainless—can be economically applied to modernize your equipment, to make it lighter, stronger, more enduring, less expensive to operate, cheaper to repair, write us. Address nearest district office.

U·S·S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
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UNITED STATES STEEL

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Engineering FORECAST

(CONTINUED FROM PAGE 146)

reliability." Contrasted to this is, "We expect a great change to take place in transmission design in the near future. We believe implicitly in the use of automatic or semi-automatic transmissions, either mechanical or of the hydraulic turbine type." Concurring is, "The advent of the infinite ratio transmission. or at least some form of automatic seems perhaps two years in the future."

Axle design is all tied up with legal load limits and legal load limits with politics within the various states and for that reason engineers are inclined to be non-committal about modification of axles. One pessimist thinks that we can expect a continuous clamping down of permissible weights and that should give impetus to the third axle or six wheeler. Another thinks that some attention will be given to third axles simply as a result of the economics of weight distribution and that particular attention will be given to correct articulation.

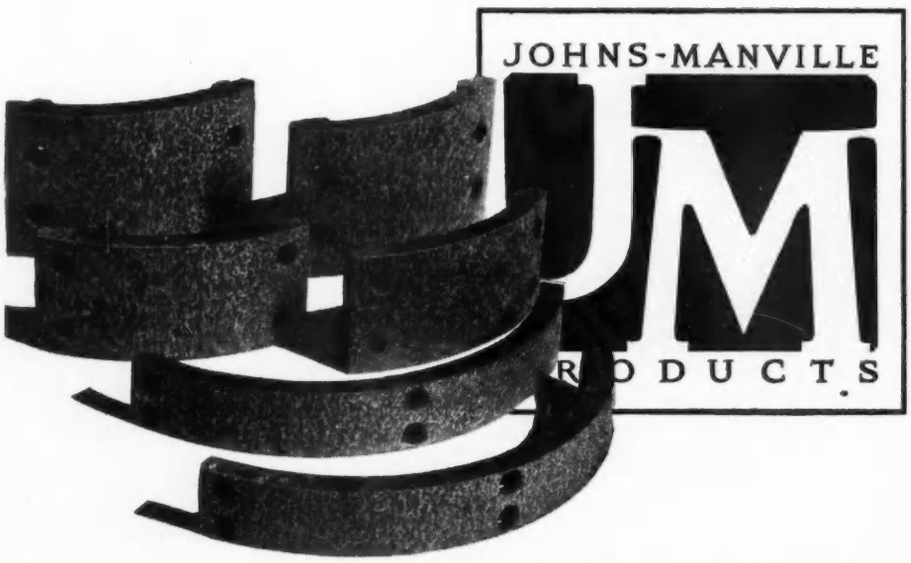
Before making any comments on the improvements in brakes, the designers collectively rise to defend the present product. They decry the tendency of manufacturers to install brakes inadequate for the vehicle and also the prevalent practice of truck operators of loading trucks beyond their braking capacity. After getting this off their chests, the designers agree almost unanimously, in detail, that brake improvement will come from more efficient brake lining and improved metal in the drums as well as improved heat radiation. None of them look for any change in the method of applying brakes except one free thinker who looks for a decided trend back to mechanical brakes, especially on the larger models.

On a question relative to the effect of union activity among drivers on truck design, most of the engineers accustomed to dealing with physical laws and not human emotions, said: "No comment." However, one designer had convictions which substantiated the long held and frequently expressed views of COMMERCIAL CAR JOURNAL. He declared: "Increasing labor costs generally means the necessity of improving the tool that labor uses to keep increased wages from affecting the cost of the product by increasing the output. In the case of the truck, an immediate result would seem to be an additional incentive to provide adequate power."

Door-to-door delivery units are in for more of what they have been getting in the way of design. That is, low floors, better frontal vision, reduced weight, easier accessibility to package stores and more room for packages. The idea is prevalent that there is still plenty of room for improvement. Simplified controls are due to come. These units will probably be the first to feel the ideas expressed in the paragraphs dealing with transmission design.

Only one engineer says that he has not based his thinking on an anticipated legal performance requirement. The rest have been giving the matter serious consideration and it seems to have been a painful process. Not that they are particularly opposed to a performance re-

(TURN TO PAGE 150, PLEASE)



J-M BRAKE BLOCKS

are the choice of America's leading truck and bus manufacturers

LEADING truck and bus manufacturers select Johns-Manville Brake Blocks for original equipment because they know that these rugged blocks deliver the *lowest maintenance cost per mile.*

Through your jobber, J-M offers you the same dependable low-cost braking material. And, through J-M's free Brake Advisory Service, you are sure of getting the right style and type of block to meet your individual needs. For complete information on how you can benefit by this free service, write Johns-Manville, 22 East 40th Street, New York City.

JOHNS-MANVILLE

THE OLDEST NAME IN BRAKE LINING

1938 BUS TRANSPORTATION MAINTENANCE AWARDS FURNISH

TRIPLE PROOF!

ATLANTIC GREYHOUND, Winner of the Intercity Gold Award

SAN ANTONIO PUBLIC SERVICE, Winner of the City Gold Award

SCHUYLKILL VALLEY LINES, Winner of the City Silver Award

THERE'S MORE

MPR

(MILES PER REPLACEMENT)

IN

Packard 440 CABLE

Three out of four for Packard 440! Once again the *Bus Transportation* Maintenance Awards furnish convincing proof that the cable with the secret-formula, inorganic, protective sheath gives more MPR—more miles per replacement.

There's no magic to it—Packard 440 is just a better, more scientific cable. The inorganic sheath is made to resist the effects of heat, cold, oil, moisture, abrasion and corona—the agents which deteriorate the old *organic* cotton-braid and lacquer coverings and which necessitate frequent replacements. We have had testimonial letters from owners of large fleets assuring us that Packard 440's useful life is as high as *three times* that of ordinary cable.

With the increasing luxury of bus interiors—and the higher original cost which this luxury entails—economy of maintenance and operation becomes even more important. Join the swing to Packard 440, and *cut down on your cable replacements.* You'll get more MPR with Packard 440. Packard Electric Division, General Motors Corporation, Warren, Ohio.

Packard
REG. U.S. PAT. OFF.
TRADE MARK

THE STANDARD WIRING EQUIPMENT OF THE AUTOMOTIVE INDUSTRY

Engineering
FORECAST

(CONTINUED FROM PAGE 148)

quirement but they have fears that the performance requirement may be expressed in terms of grade ability which they feel would be a mistake.

Then there is the possibility that the legal requirement may be put into force before legislatures are fully informed on the subject with the result that the requirement will be so stiff as to seriously interfere with operation and handicap the trucking industry in competing with other forms of transportation. Several engineers suggest that there be two requirements—one for trucks and another for tractor-trailer combinations.

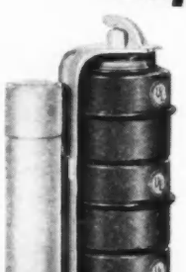
Relative to appearance several engineers say that it will continue to change, and with the written equivalent of a shrug of their shoulders attribute it to sales reasons. One views the subject as too complex to comment on briefly. Another says, "Eventually operators will call a halt on the artificial obsolescence which this involves as well as on the great prejudice to accessibility for maintenance which results."

Another engineer thinks that appearance changes will be of a practical nature giving the operator more carrying space for total length, the driver better appointments and better ride and the maintenance man, greater accessibility. A final opinion expresses the thought that a truck is not only a locomotive for pulling freight in that it has advertising value and for that reason the best possible appearance is desirable.

One direct quote provides an optimistic note with which to end this engineering poll. "It is the writer's sober thought that with the return of more normal business conditions there will be a renaissance of high grade designing and high grade manufacture of motor trucks."

ANTHES OFFERS
Two New Truck Flares
Tested and approved by Underwriters Laboratories
Complying with State and I.C.C. Requirements

Superior MOTOFLAR

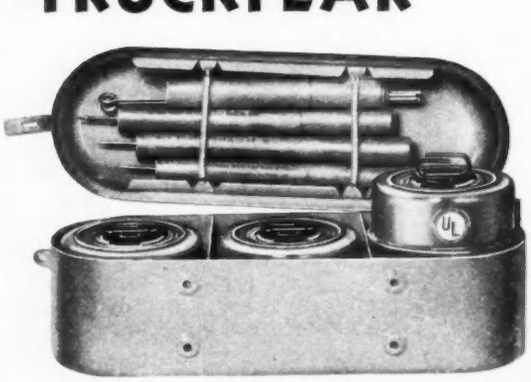


Here is a husky stacked bracket type unit for permanent mounting. It employs 18 gauge steel throughout, as required by Underwriters Laboratories. A spring and cam type closure absolutely prevents all rattle and eliminates wear, thus making possible several times ordinary service life. Of course, it uses the time tested and approved Anthes burner.

Fusee and flag case furnished optionally at slight extra cost, for mounting as shown, or for attaching inside cab.

Superior TRUCKFLAR

Interstate operators who carry flares, flags and fusees together as a check-out unit or for permanent mounting will welcome the new Anthes TRUCKFLAR. The case is made of heavy gauge steel to withstand rough usage and eliminate rattles. The modern design and baked enamel finish give the unit a smart appearance. The stream-line case is less bulky. Pins and hasps eliminate hinges. Flares are held in place by angular spring hold-downs. Fusees and flags are carried in the lid.



TRUCKFLAR lid holds several flags and three or four fusees. Rear side of case is provided with embossed knock-outs and bottom with holes for mounting.

ANTHES FORCE OILER CO.
FORT MADISON, IOWA

SHOP EQUIPMENT

(CONTINUED FROM PAGE 59)

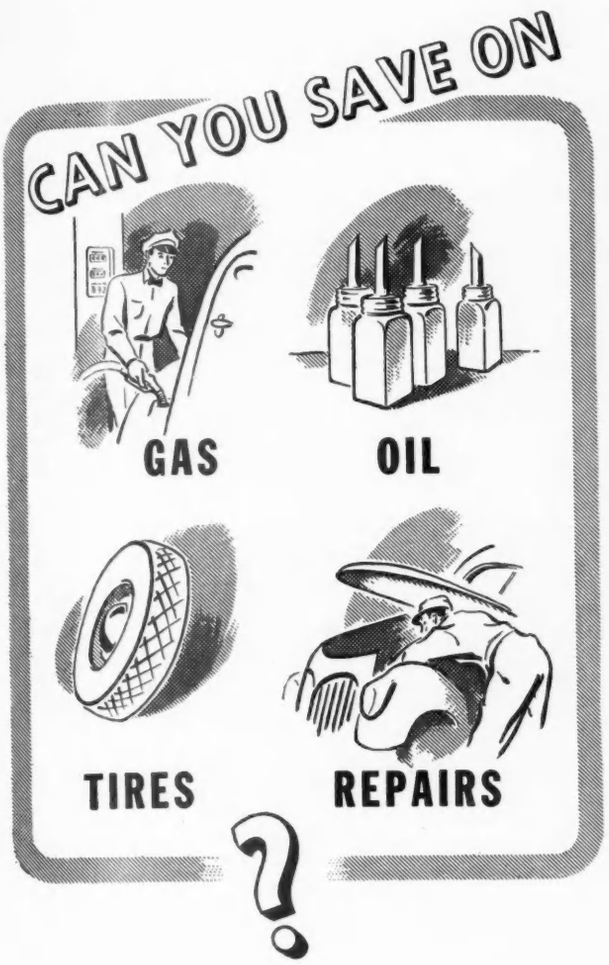
tests for coils, condensers and all of the latest generator equipment including voltage regulators and relays. Further, it will furnish exact load readings of lamps, radio, heater and other accessories. More details from C. E. Niehoff & Co., 230 W. Superior St., Chicago.

Light-Weight Fountain Brush

A light-weight fountain-type brush featuring a hollow cast aluminum head and aluminum handle has been introduced by the Flour City Brush Co. In operation water from hose passes through the handle and is fed direct to the soft long-wearing

bristles. The entire unit weighs less than three pounds. Full details and a 72-page brush catalog may be had from the manufacturer. Address Flour City Brush Co., 301 5th Ave. So., Minneapolis, Minn.

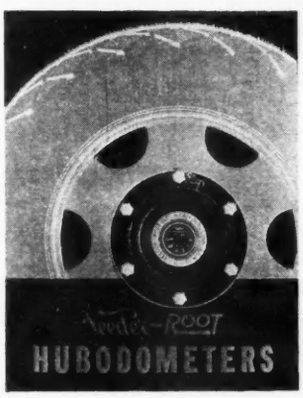
(TURN TO PAGE 167, PLEASE)



VEEDER-ROOT Hub Odometers will tell you...

When you get accurate daily mileage records, you can plainly see any possible chances to save. And you can get these records from Veeder-Root Hub Odometers . . . rugged, reliable instruments that record *every move* your trucks make, backward and forward. They are factory-adjusted to check to 1/10" with all changes in wheel and tire dimensions . . . built for permanent precision . . . designed to resist and reveal tampering . . . double-sealed against dirt and grease.

Veeder-Root Hub Odometers have pointed the way to important savings for operators all over the country. Find out what they can do for *you*.



WRITE TODAY FOR THIS FREE BULLETIN

Veeder-ROOT INC.

HARTFORD, CONNECTICUT, U. S. A.

HARTFORD, CONNECTICUT. Offices in Boston, Chicago, Cincinnati, Cleveland, Detroit, Greenville, S. C., Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, Montreal, Buenos Aires, Mexico City, London, Paris, Tokio, Shanghai, Melbourne.

BRIDGEPORT THERMOSTATS for Dependable Heater Operation

The thermostat is the heart of the heater. Any heater is a *better* heater with a Bridgeport Thermostat to guide it in sure, prompt and unfailing operation.

You can reduce service costs and expensive replacements by standardizing on dependable Bridgeport heater Thermostats.

Distributed exclusively to the Wholesale Trade through

UNITED MOTORS SERVICE INC.
in 23 principal cities.

Manufactured by

Bridgeport Thermostat Co., Inc. Bridgeport, Conn.

New Esso Fleet Oil

A motor oil designed especially to meet the requirements of truck and bus fleet operators was announced last month by the Esso Marketers, who will market this product under the brand name Stanfleet motor oil. The oil was developed in the company's laboratories following comprehensive engine tests, after which it was placed in actual operation in truck fleets whose operators cooperated in a field test program.

This product has been introduced following the demands of truck fleet operators for a lubricating oil that would stand up under the severe service imposed by sustained hauls of heavy loads at high speeds in varying temperatures. It is especially refined by the advanced solvent refining process, has a high viscosity index, low carbon forming tendencies, low pour point and unusual resistance to piston varnish, ring-sticking and sludge deposits.

Holland Piston Rings

Holland, Mich., the town made famous by tulips and furnaces is the home of the Holland Piston Ring Co., recently organized by Russel S. Rowen and J. D. McLeod. The new company has taken over the equipment of the Covert Mfg. Co. and the Re-Nu Parts Corp. and will continue to manufacture the Hete-Pruf lines as well as a brand new segment ring known as the "Cast-vent."

The new ring has only one steel segment, which is on top of a deeply cut cast spacer. Elimination of the lower land facilitates oil return through the holes. Both segments are expanded by a well ventilated inner ring. Remarkably good results in badly worn cylinders are claimed for the new product. Full details from Holland Piston Ring Co., Holland, Mich.

Oxy-Acetylene Cutter

A new oxy-acetylene cutting attachment has been developed by The Linde Air Products Co. which will be useful for shops where the amount of cutting does not justify the purchase of a separate cutting blowpipe, and for those operations in the field where incidental cutting is to be done or where a minimum of equipment is desired.

The new Oxweld (Type CW-23) cutting attachment will cut any thickness of steel up to 8 in. Due to a new, improved injector principle, it operates with exceptionally accurate control of gases, and performs equally well with low-pressure or medium-pressure acetylene. It is also characterized by the unusual stability of its preheating flames and superior flashback resistance.

The CW-23 can be used with either the W-17 or W-22 Oxweld Welding Blowpipes. It extends the usefulness of either blowpipe by adapting it to cutting steel, wrought iron, and cast iron. Full details from the Linde Air Products Co., 205 East 42nd St., New York.

Battery Non-Flood Device

An effective means of preventing excessive filling of storage batteries, particularly when they are mounted under the hood, has been developed by Goodrich engineers. Essentially the device consists of a small barrel screwed into the under side of each cell cover before the battery is assembled. In operation the barrel moves up when the cap is removed closing two air vents in the side of the barrel. Air is thus trapped at the top of each cell to the depth of the barrel preventing filling beyond that point. When water rises within the barrel it is time to stop filling. As the cap is screwed down, the air vents in the barrel are opened, and water remaining in the barrel is evenly distributed. For complete details, write the B. F. Goodrich Co., Akron, Ohio.

Gunk Renews Finish

After several months of research, the chemical laboratories of the Curran Corp., have discovered that their self-emulsifying solvent, Gunk, possesses the valuable properties of degreasing aluminum engine castings and leaving them with a new silver-white appearance without any chemical effect, etching, or loss of weight of the metal.

Battery Shelf Life

The National Battery Manufacturers Association recently approved and adopted

the recommendations of its technical committee on "Battery Shelf Life."

The report of the committee follows:

"The Technical Committee wishes to call attention to the fact that when batteries are allowed to stand on open circuit, a definite impairment may result, and it recommends that batteries be placed on charge when a drop in gravity of 30 points has taken place, or after a standing period of six weeks has elapsed, whichever occurs first."

Hastings, Pak-Age-Car S. M.

Roy H. Faulkner, president of the Pak-Age-Car Corp. has announced the appointment of Fred Hastings as sales manager of the company. Mr. Hastings has been associated with affiliated companies for a number of years and is well known in the automotive field.

A. R. Gribben, long identified with the automotive trade in New York and other Eastern states, is the new assistant sales manager.

The company recently took over the patents and sales rights of the former Stutz Pak-Age-Car and production is now under way at the company plants in Connersville, Ind.

U.C.C. Promotions

J. N. Walker has been elected vice-president of Oxweld Acetylene Co., a unit of Union Carbide and Carbon Corp., New York. Mr. Walker has been general sales manager of The Linde Air Products Co.

Metro Magic Door, made of flexible steel and designed to raise and lower like a window shade is the latest product of the Metropolitan Body Co., Bridgeport, Conn. It travels in a track and curves under the roof when raised eliminating the hazard and inconvenience of swinging doors. The new product will be offered shortly as optional equipment on Metro double-capacity bodies

T. D. Cartledge, formerly assistant general sales manager, has been appointed general sales manager of The Linde Air Products Co., succeeding Mr. Walker.

Sept. Truck Loadings Up

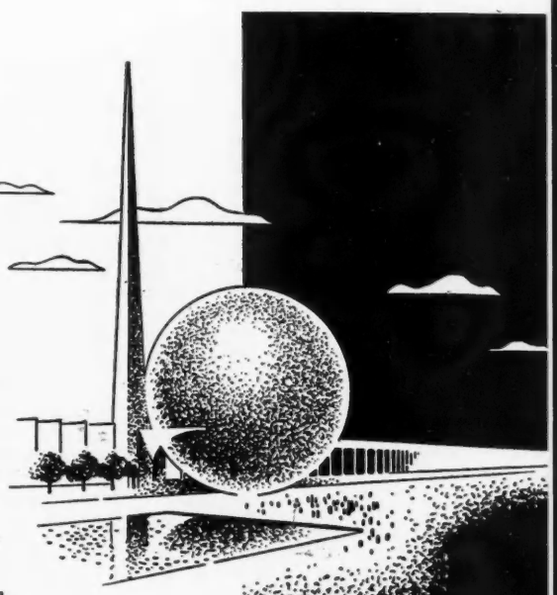
For the first time in any month this year, movement of freight by truck exceeded in volume the 1937 tonnage, according to the monthly compilation of loadings, containing figures for September, issued by the American Trucking Associations, Inc.

Comparable reports received from 161 carriers in 35 states showed an aggregate total of 679,187 tons, as compared with 665,098 tons in September last year and 664,290 tons in August, 1938. The current figures represent an increase of 2.11 per cent over last year and 2.24 per cent over the preceding month.

The increase in tonnage is believed to be significant as indicating a general improvement in business, especially in view of the fact that drivers' strikes in Baltimore, New York, Kansas City and Omaha and the hurricane in New England interfered with the normal movement of traffic.

The September figures also showed an increase over 1936 of 6.84 per cent. The ATA truck loadings index figure for September stood at 106.84, compared with 107.73 in August and 90.68 in July. In computing the index figure, the 1936 monthly average is taken to represent 100.

September gains were heaviest in the general merchandise class (l.c.l. freight) and in the transportation of petroleum and petroleum products. These gains were sufficient, however, to overcome losses in traffic among automobile and iron and steel carriers.



Operating, as you will, in an exposition year that promises to be prosperous, prepare your fleet for more crowded highways than ever before. Prepare by balancing all brakes with Grey-Rock Balanced Brake Blocks.

Using black-edged Grey-Rock HiWay Blox, orange-edged Grey-Rock Brake Blocks, and the Grey-Rock Guide, you will obtain perfectly balanced brake action for every vehicle in your fleet—sure, safe stops for big trailer-trains as well as little pick-up trucks. The Guide includes brake balancing instructions for mountain country or unusual traffic conditions, solutions to increasingly stiff state and federal brake standards, answers to seemingly impossible brake problems, a condensed and systematic trouble-shooting system, plus new brake mileage and economy.

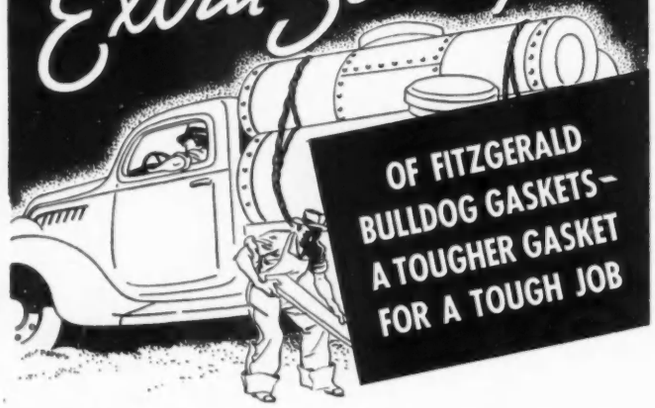
Enter 1939 relying on a brake balancing plan which grew out of 250,000 field studies and which is acclaimed by fleets everywhere. Prepare to meet 1939's increased traffic by asking for your copy of the Grey-Rock Guide, and by seeing your Grey-Rock jobber about the many services he offers.

Grey-Rock BALANCED BRAKE BLOCKS

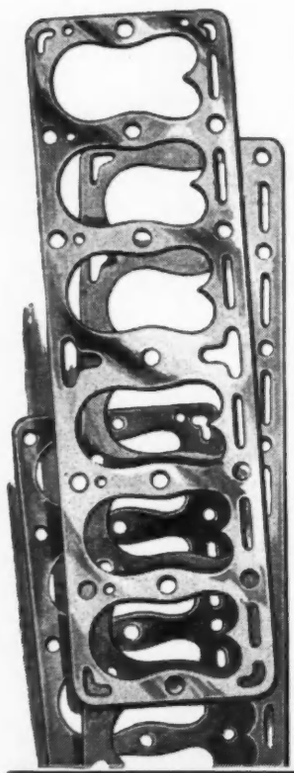
UNITED STATES ASBESTOS DIVISION *of Raybestos-Manhattan, Inc.*, MANHEIM, PA.

BRAKE LININGS • CLUTCH FACINGS • FAN BELTS • HOSE • PACKINGS • RELINING EQUIPMENT

Modern trucks demand the Extra Strength



● **Finest materials, scientific design and expert workmanship make the Fitzgerald Bulldog Gasket remarkably strong and durable, extra heat-resisting and extra shock-proof.**



You can count on these better gaskets to measure up to the most rigorous demands of modern heavy duty service. Let your jobber give you details of Fitzgerald's complete gasket service, which includes gaskets and grease retainers for every need. The Fitzgerald Manufacturing Company, Torrington, Conn. —Branches, Chicago and Los Angeles—New York Office—Canadian Fitzgerald, Limited, Toronto.

FITZGERALD GASKETS

THE COMPLETE LINE THAT COMPLETELY SATISFIES

—"Have you heard of the wonderful one hoss shay"

"Have you heard of the wonderful one hoss shay,
That was built in such a logical way
It ran a hundred years to a day,
And then of a sudden, it—ah, but stay,—"

Many a modern automobile is driven farther in a single year than the legendary "one hoss shay" probably was in all its century of existence. Today's swift pace of travel would have wrecked the famous old vehicle in a comparatively short time. Automotive engineers know that wear and damage are inevitable. But in spite of this natural deterioration, the serviceability of the automobile is not limited to either miles or years. Replaceability of all parts has given the automobile virtually perpetual life. The valves in your pneumatic tires are no exception.

Schrader Tire Valves were one of the first automotive assemblies to embody replaceability and interchangeability. The Schrader Valve Cap and Core will fit every standard tire valve irrespective of the size of valve or tire. Purchasers of 1939 cars, as well as the owners of millions of earlier models, will find Schrader Tire Valves most dependable under today's severe conditions.

Schrader Tire Valve Parts—the Valve Core and Valve Cap—are distributed throughout the world to provide motorists everywhere with quick and inexpensive tire valve service.

SCHRADER TIRE VALVES PROVIDE:

1. *The economy of a replaceable core, assuring quick inspection and service everywhere.*
2. *The protection of an air-tight valve cap to positively seal the valve and keep the mechanism free of dirt and road sludge.*

Schrader

REG U.S. PAT. OFF

A. SCHRADER'S SON, BROOKLYN, N. Y.

Division of Scovill Manufacturing Company, Incorporated

SHOP EQUIPMENT

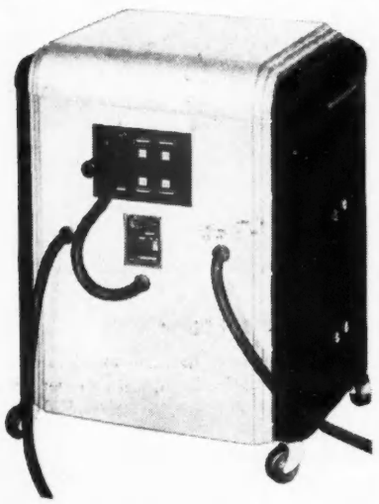
(CONTINUED FROM PAGE 150)

Bear Inspecto-Scope

Its an old adage that we should stoop to conquer, but Bear offers a new short cut to the process, enables anyone by means of the Inspecto-Scope to see chassis parts with ease. It's all done with mirrors, or at least a mirror, fastened to the end of a long handle with an adjustable mount. It comes in mighty handy behind the instrument panel too. Full details from Bear Mfg. Co., Rock Island, Ill.

Welder Uses Spun Glass

That amazing product, spun glass, which is as soft and flexible as silk, yet stronger by weight than steel, has found its way to a new use, in the Commonwealth Electric Welder. Because spun glass can withstand

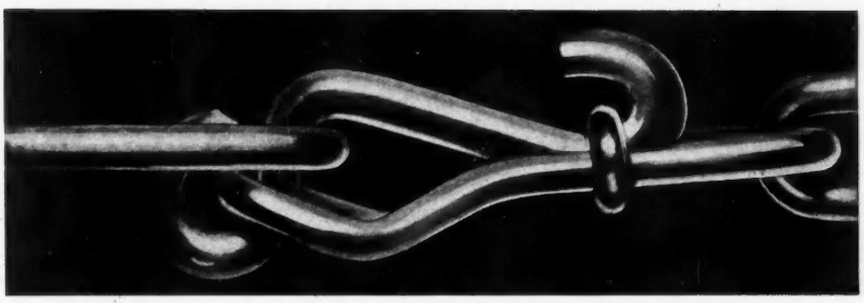


temperatures up to 1000 deg. Fahr., is impervious to oils or moisture and is extremely compact, it has been used in all coils of the new welder, providing virtual burn-out-proof protection. A one year guarantee is offered for the first time. Full details from the Commonwealth Mfg. Corp., 4208 Davis Lane, Cincinnati, Ohio.

(TURN TO PAGE 168, PLEASE)

McKAY

offers fleet owners these big advantages



● **SPEEDY FASTENER**—The McKay Klip-Lock will save your operators' time! It is unlike any other fastener. Much quicker to open and close. *Anybody* can close it . . . doesn't stick or jam . . . doesn't clog, freeze, or rust shut . . . locks Chains on tight . . . unfastens with one hand.

● **LONG WEAR**—Every type of McKay Truck Chain is built and road-tested to outwear other chains, but, *for the lowest cost per mile,* use McKay Multi-Grip! This is the *only* bar-reinforced truck chain with DOUBLE reinforcing bars. Result—super wear, super traction.

● **JOBBERS EVERYWHERE**—Ample stocks of McKay Truck Chains in every section assure you of quick deliveries under weather stress.

THE McKAY COMPANY
McKay Building, Pittsburgh, Pa.

McKAYS *are the choice, by competitive test, of many of the largest fleets!*

McKAY TRUCK CHAINS

Licensed to manufacture and sell Bar-Reinforced Tire Chains under United States and Canadian Letters Patent: The McKay Company; American Chain & Cable Co., Inc.; The Hodell Chain Co.; Pyrene Mfg. Co.; Dominion Chain Co., Ltd.; and Pyrene Mfg. Co. of Canada, Ltd.

When writing to advertisers please mention Commercial Car Journal

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48-page Automotive Cleaning Handbook. Goes thoroughly into all cleaning problems connected with truck operation and maintenance. Send for your copy TODAY.

Whether you buy or lease your tires, MAGNUSOL will effect maintenance savings equivalent to 15,000 miles of tire wear . . . for every truck you operate!

How? Through labor, time and material economies! MAGNUSOL takes the "cling" out of grease and oil. It cleans small parts quickly and thoroughly . . . exteriors without injury to finish . . . undergear rapidly for inspection . . . cement floors without time-wasting scraping . . . etc.

MAGNUS CHEMICAL COMPANY

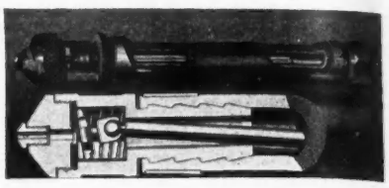
Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

38 South Avenue Garwood, N. J.

MAGNUS CLEANERS

Air-O-Chek Valve

A handy air check valve designed for insertion in the air line to provide a positive shut-off is announced under the name Air-O-Chek. The entire unit is scarcely larger in diameter than the average air line. There are no buttons or protruding parts, air being turned by simply bending the unit. It is



connected in series with the line, and can be furnished with male or female joints. For full details, write Air-Way Pump & Equipment Co., 625 W. Jackson Blvd., Chicago.

Novel Tire Spreader

Those who want to make tire inspection really worthwhile will find the new "Speedy" tire spreader has just about all that could be desired. As the tire revolves on special rollers, powerful jaws which open and close by a single foot pedal spread the casing. An adjustable protected light is so mounted as to shine inside the tire. The steel frame provides a handy tool spray. Full particulars from the maker, Leffe Brothers, 1189 Bedford Ave., Brooklyn, N. Y.

SHOP EQUIPMENT

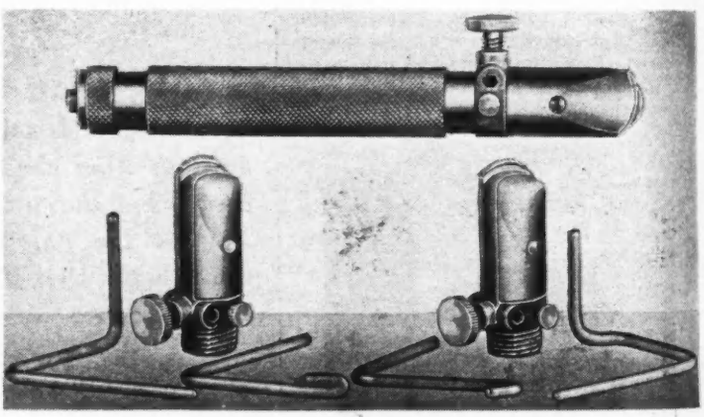
(CONTINUED FROM PAGE 167)

Precision Paint Striper

A simple precision paint striping tool providing a convenient and economical means of applying decorative lines of uniform weight and thickness has been announced by DeVilbiss. Operating equally well with paint, lacquer or synthetic enamel, the striper is held in the hand like a fountain pen and drawn across the surface to be striped. Single, double or triple lines can be laid side by side at any desired interval by simple adjustment of guides.

Painting material is uniformly supplied from the paint chamber to the striping wheel by a gear pump in the head of the tool. This pump operates at a speed commensurate to the action of the wheel. Requiring no compressed air, the tool is simple to operate and easy to clean. It is furnished with three interchangeable heads for striping widths of 1/64 inch, 1/32 inch and 5/64 inch. Extra head for broad ⅛ inch striping is available.

Complete information on the new paint striper, Type AS, may be secured by writing The DeVilbiss Co., Toledo, Ohio.



Above: The DeVilbiss striping tool showing completely assembled unit and extra heads

Lifter Gets Tough Heads

To all who have had the problem of getting tightly stuck aluminum cylinder heads loose without damage, the new W-N head lifter will prove of real interest. With stud nuts off and spark plugs out, it is merely necessary to screw two special bolts in the

DENMAN DOUBLE-LIFE TRUCK TIRES

The peer of any tire made regardless of price, specially built for one or more future retreadings or recappings—will positively spread your tire dollar over more miles, no matter what your present set-up. DENMAN TIRE AND RUBBER COMPANY, WARREN, OHIO

Used By America's Leading Industries

Baker Truck Snow Plows are used by Ford Motor Co., Eastman Kodak Co., General Electric Co., Packard Motor Car Co., and scores of other nationally-known industries as well as important large cities.

Ask for Snow Plow Catalogs

THE BAKER MFG. CO., 571 Stanford Ave., SPRINGFIELD, ILL.

America's Oldest Makers of Snow Plows for Highways and Streets

BAKER SNOW PLOWS

HOISTS
BODIES
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HEIL Quality Products

SNOW
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MANUFACTURED BY

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FACTORIES:

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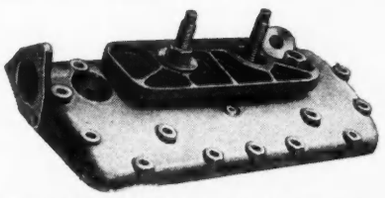
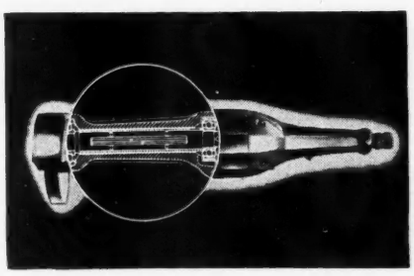
spark plug holes and drop the head lifter plate over the bolts so that it rests on the engine block studs. Then when nuts are pulled down on the two bolts of the lifter, the head is drawn upward. One model fits



Ford "60" and "85," Lincoln-Zephyr, Plymouth, Dodge, DeSoto and Chrysler. For further information write Tool Division, Westcott Chuck Co., Oneida, N. Y.

Shock-Absorbing Grinders

Three new Thor portable electric grinders featuring a shock absorbing spindle have recently been introduced in 4, 5 and 6 in. sizes. Spindles are of two-piece design joined by resilient steel strips which absorb all vibration from the grinder before it reaches the motor. Longer trouble-free life is claimed. The 4 in. model



weighs only 10 lb., is 19 in. long and operates at a free speed of 6000 r.p.m. Larger models are proportionately light and compact. A new booklet giving specifications and prices is available from the factory. Address Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.

(Turn to Page 170, Please)

Avoid Vapor Lock

An electric fuel pump. Installed close to fuel tank, it pushes fuel to engine, avoiding vapor lock. Thoroughly reliable. Applicable to any gasoline-driven vehicle. Will not flood.

KING-SEELEY CORPORATION
ANN ARBOR, MICH.

KS FUEL PUMP

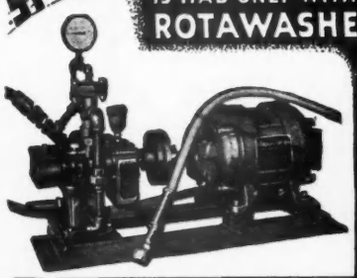
BUILT TO PUT
MORE PAY IN EVERY PAYLOAD

Arrange for an "on-the-job" test today
112" wheelbase Ford V-8 Commercial Cars
122" wheelbase One-ton Trucks
134" and 157" wheelbase Trucks
101" and 134" Cab-over-Engine Trucks.

FORD V·8 TRUCKS

Ford

SPEED WASHING
IS HAD ONLY WITH
ROTAWASHER



CLEANS CARS BUSSES TRUCKS FASTER BETTER
Send for details

WASHES CARS & TRUCKS FASTER AND BETTER

Pace-setting in time-saving, labor-saving, and money-saving washing results! Increases profits for wash rack operators! Rotawasher radically cuts cleaning costs for fleet owners! Let it modernize your washing as it's doing for so many others.

Rotawasher is ideal for cleaning floors in garages and oil stations, also for cleaning chamois skins.

Write at once for our Folder

THE ROTAWASHER CORP.
122 E. St. Clair Ave., Cleveland, Ohio

KINNEAR TRUCK DOORS
Also Doors for Buildings

ALL METAL . . .
. . . . . Coils like a window-shade, out of the way . . . . .
CONVENIENT
BURGLAR PROOF
FIRE PROOF
MORE DURABLE
Write for Details

KINNEAR
Manufacturing Company
2100-20 FIELDS AVE.
COLUMBUS, OHIO

Gunk CLEANS CLEAN

DEGREASER

COLD PROCESS
GENERAL PURPOSE
GARAGE AND CHASSIS
GREASE REMOVER

Gunk CLEANS CLEAN

Not only dissolves grease and oil but emulsifies it as well
Your wholesale jobber has GUNK CONCENTRATE or can pick it up for you—ASK HIM!
THE CURRAN CORP., BOSTON OR WEST COAST: 445 TURK ST., SAN FRANCISCO, CALIFORNIA

One Fleet Operator Washes 72 Trucks In 2 Hours With 2 BEAURLINE FOUNTAIN BRUSHES

IMPROVED ROUND MODEL

In the past 14 years thousands of fleets all over the country have found Beaurline, the original fountain type car washing brush, saves the most time and money in keeping their vehicles clean.

Write for complete information on several new models, shapes and sizes, and for new low prices.

BEAURLINE FOUNTAIN BRUSH CO.
1243 S. Wabash Ave., Chicago.

Fully covered by U. S. Patents

NEW OBLONG MODEL IN VARIOUS SIZES

Insist Upon ARROW Signals

Demand, insist upon and get this extra Arrow Quality—it costs no more!

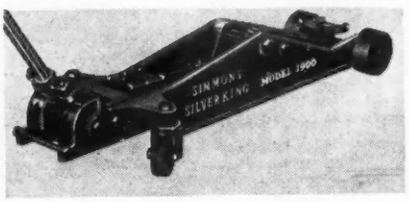
ARROW SAFETY DEVICE COMPANY, INC.
MEDFORD, NEW JERSEY

SHOP EQUIPMENT

(CONTINUED FROM PAGE 169)

Heavy Duty Floor Jacks

New heavy-duty Simmons Silver King floor jacks meet virtually any requirement in the truck shop. Both have a twin-pump hydraulic mechanism. Model 1400 has a rated capacity of 5 tons; model 1900, 7



tons. Both give a 17 in. lift starting 5 in. above the floor. An interesting leaflet describing features and specifications will be mailed upon request to the Simmons Mfg. Co., Ashland, Ohio.

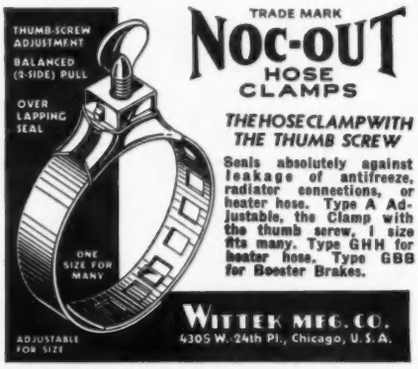
New Supersocket Wrenches

Three new series of Bantam "Supersocket" wrenches have been added to the Williams line. An extra deep 12-point series has sockets 2 to 2½ in. long, the

SPECIAL OFFER TO TRUCK OWNERS

Now you can exchange any service worn Leibing Governor for a new factory calibrated Leibing at any factory branch or dealer of Diamond "T", Federal, G. M. C., International or White trucks or any Leibing dealer or distributor. Exchange prices range from $3.75 to $5.50.

LEIBING AUTOMOTIVE DEVICES, INC.
DETROIT, MICHIGAN



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NOC-OUT HOSE CLAMPS

THE HOSE CLAMP WITH THE THUMB SCREW

Seals absolutely against leakage of antifreeze, radiator connections, or heater hose. Type A Adjustable, the Clamp with the thumb screw, 1 size fits many. Type GHH for heater hose. Type GBB for Booster Brakes.

WITTEK MFG. CO.
4305 W. 24th Pl., Chicago, U.S.A.

Type T
MASTER-LIGHT
for Truck Service

Cab Roof Mounting
Revolves 360°
No Blind Spots
Speeds Runs and Deliveries
Details on Request

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CAMBRIDGE, MASS.

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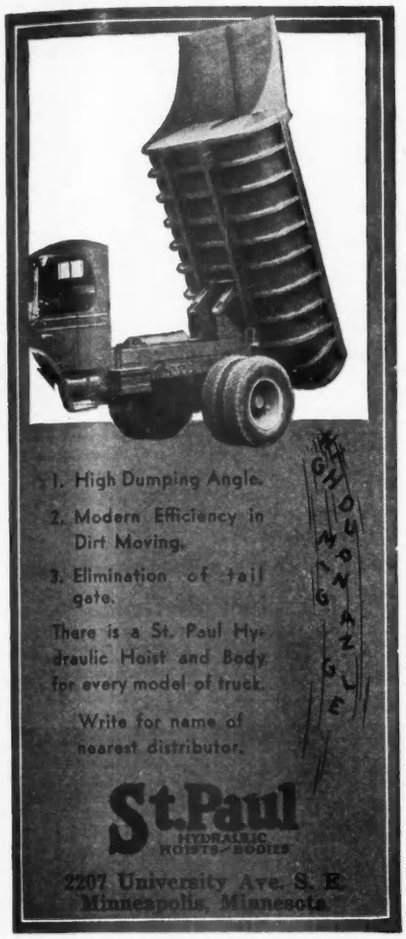
in Fleet Operator Reader Preference

STOP AT BOOTH NUMBER ONE NATIONAL MOTOR TRUCK SHOW

See the new Warford Multi-Wheeler and Aux. Transmission

WARFORD CORPORATION
44 WHITEHALL STREET NEW YORK CITY, N. Y.


1. High Dumping Angle.
2. Modern Efficiency in Dirt Moving.
3. Elimination of tail gate.
There is a St. Paul Hydraulic Hoist and Body for every model of truck.
Write for name of nearest distributor.
St.Paul
HYDRAULIC HOISTS-BODIES
2207 University Ave. S. E.
Minneapolis, Minnesota

"Did you say FREE NO-FILM for 12 Trucks?"

ANSWER—Yes, it's yours for the asking.

The president of your Corporation is not a mechanic but he does know how your trucks look—so does the public.

Cleaning with NO-FILM is not magic but it is sound, economical business.

The secret of NO-FILM's dirt-destroying success? It's endowed with energetic chemical action; it never leaves paint-killing film!

So send for your FREE quart of No-Film today (the offer is limited). Just tell us the number of trucks in your fleet, and we'll include our Technical Bulletins on Truck Maintenance.

The Mapor Corp.—Engineers and Chemists
151 W. 46th St., New York City

before you start—think of the finish
NO-FILM
REG. U.S. PAT. OFF.

new extra deep 8-point series sockets are 1½ in. long, while the new universal sockets are very short and compact, for close spots. All series use the ⅜ in. square driver. More details from your jobber or from J. H. Williams & Co., 75 Spring St., New York.

Bearing Service Unit

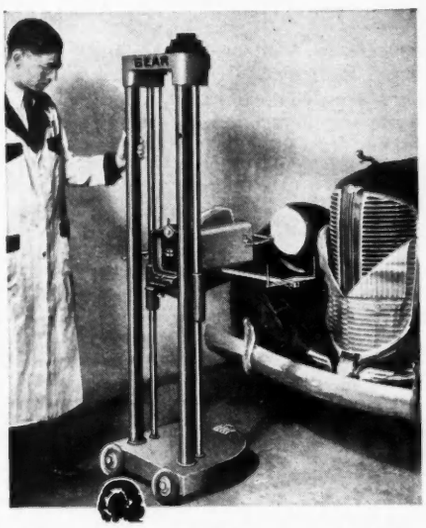
A new front wheel bearing service unit simplifies the job of cleaning and repacking. The compact unit, complete in every detail, contains bearing washer, dryer, repacker, even a replacement chart and the bearings themselves.

A wash gun forces cleaning fluid through the bearing, air pressure is used for drying

and to remove fine dirt particles. The bearing packer itself is easily operated by hand. For complete details, write Ahlberg Bearing Co., 3025 W. 47th St., Chicago.

Junior Headlight Tester

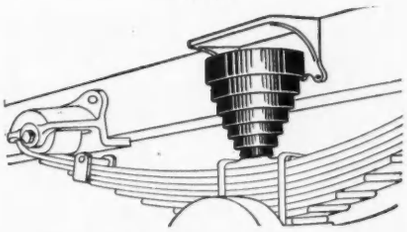
The Bear Junior Headlight Tester has been designed to provide efficient headlight testing, even in broad daylight, at low cost. A reducing lens throws the light



pattern on a graduated screen. A photo-electric cell measures light output, and a lateral aim scale graduated in degrees discloses errors in aim. A handy item for any shop. Write Bear Mfg. Co., Rock Island, Ill., for details.

(TURN TO PAGE 172, PLEASE)

Ease the load
On Your Main Springs
with



BORDIK
Shock Absorbing Auxiliary
SPRINGS

1 Bordik Auxiliary Springs make the ride level and shock-proof for heavy and uneven payloads.
2 Control road bounce, side-sway and heavy listing.
3 *Hold* the body up from striking the tires.
4 *Easily installed without disturbing your present spring set-up.*
5 Available for all trucks, buses, trailers, pick-ups and passenger cars.
6 Spring Capacities—*50 pounds to 14,000 pounds.*
7 *Cost no more than ordinary helper springs.*

Agents in All Principal Cities. In ordering, specify make, model and year of vehicle.

Write at once for information.

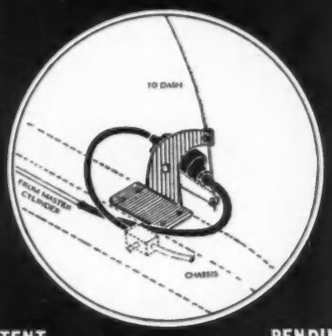
ZINK-BORDIK PRODUCTS, INC.
421 East Adams St. DETROIT, MICHIGAN
Pioneer Designers of this type of Helper Spring Assembly

FRINK SNO-PLOWS
REG. U.S. PAT. OFF.
Both "V" TYPE and ONE WAY BLADE TYPE
hand or power hydraulic control
FOR ALL MOTOR TRUCKS FROM 1½ to 10 TONS
Write for catalog 38AC and 38BC with discount to truck dealers.
CARL H. FRINK, Mfr.
CLAYTON 1000 ISLANDS NEW YORK

AUTOPULSE
ELECTRIC FUEL PUMP
- Uninterrupted Schedules
- Instant Starting
- Greater Economy
- No Vapor Lock
- Added Protection

AUTOPULSE CORP., DETROIT MICH.

Reduce
JACKKNIFING
on
ICY PAVEMENTS
with
BRAKE CHECK



PATENT PENDING

DISCONNECT YOUR FRONT BRAKES FROM THE DASH

Every driver knows the vehicle is out of control and subject to dangerous jackknifing when the front wheels are sliding.

Install BRAKE CHECK, the front brake control which allows the driver to instantly cut off the front wheel brakes, from the dash, when on slippery or icy pavements.

Pushing in the dash control instantly returns the front brakes to normal operation.

Thousands of miles of operation in many of the largest fleets have proven BRAKE CHECK 100% efficient and satisfactory.

HOW IT OPERATES

A simple ball valve is attached to the frame. Flexible tubing is cut into the T or cross fitting so that the brake fluid is directed through the valve and back into the line. A control wire to the dash tips the valve, dropping the ball into the seat, cutting the pressure to the front brakes.

A unit can be supplied for any hydraulic job. Installation is simple and the unit is guaranteed not to leak or get out of order. Liberal discounts on quantity orders. List price $10.00.

See your brake jobber today or, if he cannot supply you, write direct.

There is still some territory open for high class jobbers and good agents. Act now.

Ask the Driver—He Knows

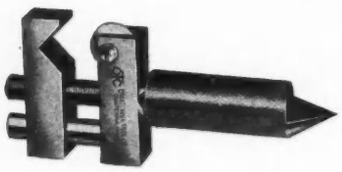
BRAKE CHECK SALES CO.
NOT INCORPORATED
7345 Harvard Avenue,
CHICAGO, ILLINOIS

SHOP EQUIPMENT

(CONTINUED FROM PAGE 171)

Tube Cutter

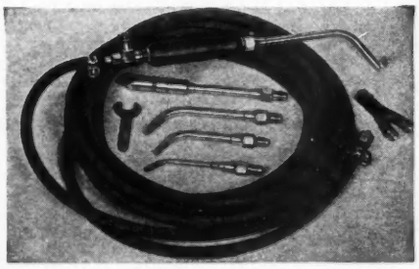
A new Owatonna tube cutter, No. 837, meets the needs of any shop in handling copper or brass tubing from ⅛ in. to 1 in. It has a positive screw feed which permits uniform cutting regardless of the diameter of the tube. A V-shaped reamer on the end



of the knurled handle serves as a reamer to remove the burr left inside the tubing. Catalog 30, just off the press, gives full details of this and other new tools. Address Owatonna Tool Co., Owatonna, Minn.

Acetylene Soldering Outfit

Body soldering with air-acetylene equipment using standard type acetylene cylinders is made possible for the first time by a new Prest-O-Lite body soldering outfit, No. 04P30. It has a torch handle with needle valve, four open flame stems and an enclosed flame soldering copper for use in confined spaces. Also included are hose

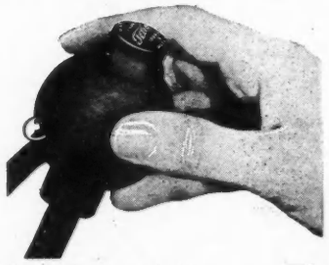


connections, Y-adapter and 25 ft. of ¼-in. hose. Particularly for shops that already have acetylene equipment, it's a mighty handy way to handle body soldering. More details from the maker, The Linde Air Products Co., 205 E. 42nd St., New York.

Button-Controlled Spray

A new "Master" spray gun incorporates a third needle valve. By merely pressing a button spray may be changed from fan to

The Original
TURN SIGNAL SWITCH FOR GEAR-SHIFT LEVER



Teleoptic "Finger-Flip"
***substitutes* for the ordinary knob on the gear-shift lever. Guaranteed for one year against all defects. You will find Teleoptic control and signals meet your most rigid requirements. Specify Teleoptic Signals when you buy new trucks.**

THE TELEOPTIC CO.
Racine, Wisconsin

JONES PORTABLE TACHOMETER

The world's largest operators of commercial vehicles use Jones Portable Tachometers to check engine speeds for tune-ups, and setting governors, etc. Here are a few: Standard Oil Co., of La., N. J., N. Y.; Shell Petroleum Co., Atlantic Refining Company, Tidewater Oil Company, Keeshin Motor Express, Mack Trucks, Brockway, U. S. Navy.

Direct, instantaneous reading

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Available Trucks

Builders of fine Motor Trucks, Tractors, Trailers and Buses since 1910.
Capacities from 1½ to 10 tons.
Write for bulletin

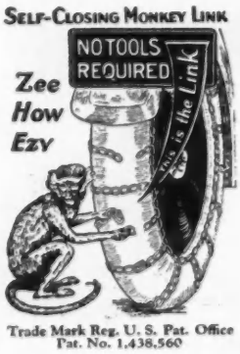
AVAILABLE TRUCK COMPANY
2501 Elston Ave. Chicago, Illinois

17,000 to 40,000 LBS. GROSS CAPACITY. TRUXMORE 3rd Axle is engineered and built to produce the lowest hauling costs per ton mile with greatest safety. Made in 5 sizes to fit any make or type truck you choose.

Write to Truck Equipment Co., Inc.,
1791 Fillmore Ave., Buffalo, N. Y.
Branches and Dealers in Principal Cities.

TRUXMORE
WORLD'S BEST 3RD AXLE

SELF-CLOSING MONKEY LINK



Trade Mark Reg. U. S. Pat. Office
Pat. No. 1,438,560

MONKEY LINK PRICES DOWN 40%

You can now get any size Monkey Link for 40% less than formerly. You can now add the further economy of price to the economies of time and effort.

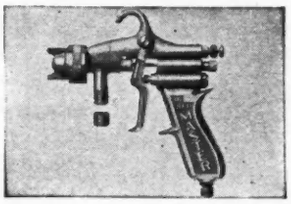
When a cross link goes—use a Monkey Link to make the repair. Chain becomes as good as new. No tools are required. Driver does the job right on the road.

FREE *Sample to Fleet Owners*

Write us for free samples. State number of trucks in your fleet and size of chains. We will send samples immediately.

FLOWER CITY SPECIALTY CO., Rochester, N. Y.
At All Reputable JOBBERS

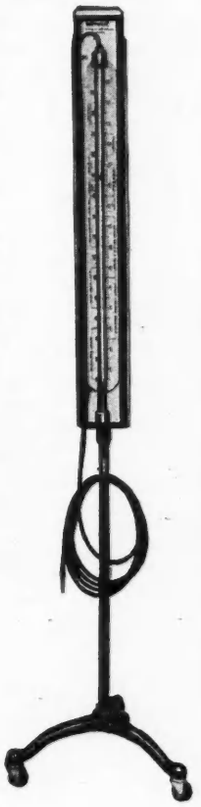
round in a split second. Releasing the button brings it back. Detachable head, extreme light weight, a filter in the handle,



and adaptability to air pressures from 20 to 90 lb. are other features. Ask for details on No. RF-11 gun. Burning Brands Co., 1400-1416 W. Fulton St., Chicago, Ill.

Mercury Column Gage

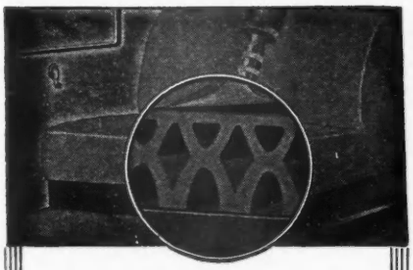
A new mercury column vacuum gage complete with many unusual features and selling at a very low price has been introduced by the Weaver Mfg. Co., Springfield. Ill. The instrument is said to be extremely easy to read and the large-face scale is complete with probable causes of engine failure. The instrument rolls on a convenient tripod stand and may be attached to any convenient place in the vacuum line. Complete details are available from the manufacturer or any Weaver jobber.



Hendrickson's 25th Anniversary

The Hendrickson Motor Truck Co., Chicago, celebrates this year its 25th anniversary in the truck field. Mr. M. Hendrickson and his four sons who founded the business May 1, 1913, are all active today.

TIME TO SWITCH
To Black Diamond All-Rubber
SEAT CUSHIONS



No better evidence of the superiority of these all-rubber seat cushions and back rests can be found than the greatly increasing number of trucks being equipped with Black Diamonds. Either as a replacement or new equipment they are tops for long life, no upkeep expense, and comfort. Made with the patented diamond grid construction so as to give greater strength and durability—they answer your demand for lower costs. Ask owners about their performance. Ask us about prices.

KARPEX MANUFACTURING CO.
1924 E. 19th Street, Indianapolis, Ind.

IT PAYS TO BUY
EDWARDS
QUALITY
SEMI-TRAILERS
EDWARDS IRON WORKS, INC.
SOUTH BEND, INDIANA

Will Handle 13 to 15 Tons! — Thornton Four-Rear-Wheel Drive, engineered into standard 1½- to 3-ton chassis—extra capacity, greater traction, double pulling power! Does work of trucks twice as large at almost half cost. Write today. Thornton Tandem Co., 8701 Grinnell Ave., Detroit

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KEEP YOUR VEHICLES MOVING ECONOMICALLY with
HALL VALVE SERVICING EQUIPMENT
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THE HALL MFG. CO.
TOLEDO, OHIO

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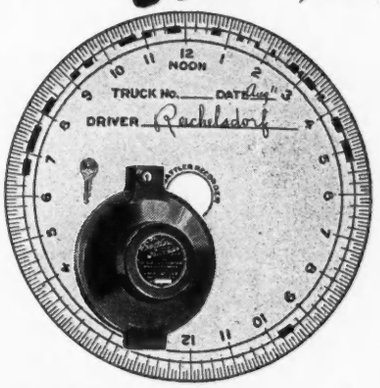

gives a complete record of the work of a truck

Enables you to check up on each truck after every day's run. Tells if rerouting is necessary, etc. Inexpensive. Entirely self-contained. No connections of any kind.

HANS SATTLER
Sheboygan, Wisconsin

A Complete Line of HYDRAULIC JACKS
Built Right . . . . Priced Right
HEIN-WERNER MOTOR PARTS CORP.
Waukesha, Wisconsin
FEW MODELS ENGINEERED TO DO THE WORK OF MANY
HEIN-WERNER hydraulic JACKS

TRUCK ENGINEERING
TRAILERS
and
BODIES
for all types of service
TRUCK ENGINEERING CORP.
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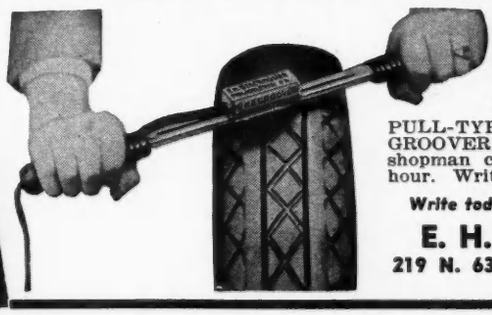
—TIRE REGROOVING ASSURES SAFETY—



In six to ten minutes a Stackhouse Tire Groover will change your bald tires into safe, serviceable "shoes" with safety and additional mileage assured. The STACKHOUSE PULL-TYPE ELECTRIC TIRE GROOVER is easy to operate—any shopman can learn to use it in an hour. Write for details today.

Write today for catalog to Dept. J-2
E. H. STACKHOUSE
219 N. 63rd St., Philadelphia, Pa.

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